DIVISION OF ENVIRONMENT
QUALITY MANAGEMENT PLAN

PART II:

BUREAU OF ENVIRONMENTAL FIELD SERVICES
QUALITY ASSURANCE MANAGEMENT PLAN

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TABLE OF CONTENTS

Section 1

INTRODUCTION

1.1 Purpose of Document

This document presents quality assurance (QA) goals, policies, organizational responsibilities, and evaluation and reporting requirements applicable to environmental monitoring programs and projects administered by the Bureau of Environmental Field Services (BEFS), Division of Environment (DOE), Kansas Department of Health and Environment (KDHE).

1.2 Historical Background

The Bureau of Environmental Field Services was established in November 1997 as part of an administrative reorganization within the Division of Environment. Several environmental monitoring programs previously administered by the Office of Science and Support and the Bureau of District Operations were transferred to BEFS at that time. Examples included the division's ambient surface water and groundwater quality monitoring programs and inspection and compliance monitoring programs for pollutant emitting facilities regulated by KDHE.

Written standard operating procedures (SOPs) for many of these programs were first developed in the early 1980s and were formally approved by the United States Environmental Protection Agency (EPA) on February 6, 1984. These SOPs summarized methods used in the collection, handling and analysis of environmental samples but provided little indication of prevailing QA policies, organizational responsibilities, and evaluation and reporting requirements. Over time, changes in the scope and complexity of these monitoring programs gradually reduced the representativeness and utility of the original SOPs.

In March 1995, the Division of Environment embarked on a major initiative to update its QA documentation. This resulted in the development of a three-part report known as the Division of Environment Quality Management Plan or "QMP." Part I of the QMP established overarching divisional QA policies and expectations and provided a consistent framework for developing QA documentation at the bureau/office level and program/project level (Part II and Part III of QMP, respectively). Part I was revised in May 1997, and again in July 2000 and October 2004, to comply with new divisional policies and federal requirements. The present document was prepared under the auspices of the latest (October 2004) revision and represents one of five bureau level QA management plans comprising Part II of the QMP.

1.3 Bureau Quality Assurance Goal

The foremost goal of this QA management plan is to ensure that all environmental monitoring operations administered by BEFS produce data of known and acceptable quality and support, in a scientifically defensible manner, the informational needs and regulatory functions of KDHE.

Section 2

QUALITY ASSURANCE POLICIES

Environmental monitoring programs administered by BEFS shall conform to the general policies set forth in Part I, section 2.2, of the QMP. In summary, the referenced section imposes the following requirements:

(1) The objectives of each environmental monitoring program or project shall be clearly delineated during the planning stages of the program/project. These objectives shall be consistent with the mission, policies and priorities of the division.

(2) Tolerable levels of data uncertainty shall be identified during the planning stages of each monitoring program/project so that appropriate procedures and resources may be incorporated into the design of the program/project.

(3) Quality assurance and quality control (QC) measures shall be integrated into all environmental monitoring programs/projects in the most cost-effective manner possible without hindering attainment of the stated QA objectives.

(4) A quality assurance program (project) plan (QAPP), describing how the activity will achieve the stated objectives and the required level of data reliability, shall be developed by the manager of each environmental monitoring program/project. This document shall be reviewed and approved, at a minimum, by the supervising section chief or district environmental administrator (DEA) and by the applicable bureau QA representative prior to initiation of data collection.

(5) Sample collection, sample analysis, and data management activities shall be subjected to periodic evaluation by supervisory personnel and outside auditors to identify and correct deficiencies and enhance the credibility of each environmental monitoring program/project.

(6) Measures shall be instituted within each environmental monitoring program/project to ensure that the quality of obtained environmental data is accurately and permanently documented.

Deviations from the above policies may be permitted in the event of unusual or unprecedented emergency situations that are beyond the scope of previously approved QAPPs and SOPs and require an immediate response based on the best professional judgment of staff. All such deviations must be carefully documented and described in end-of-year program evaluations submitted through the bureau QA representatives to the divisional QA officer (see section 4.6).

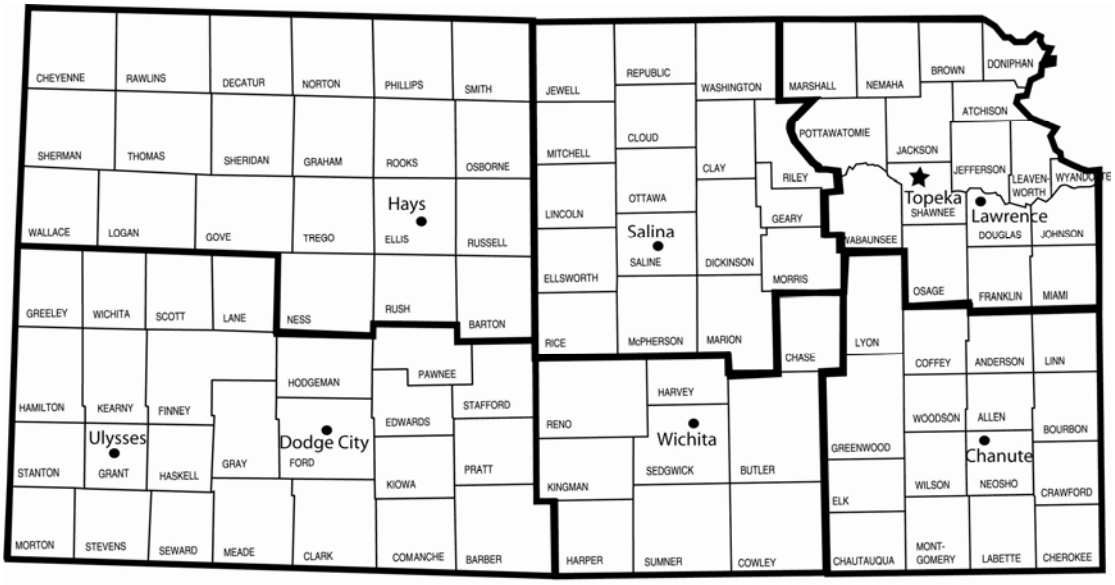
Section 3

QUALITY ASSURANCE ORGANIZATION

3.1 General Description of Bureau

The Bureau of Environmental Field Services maintains a central office in Topeka and district offices in Chanute, Dodge City (satellite office, Ulysses), Hays, Lawrence, Salina and Wichita. Central office personnel include the bureau director, district director, other administrative and clerical staff, and employees of the Technical Services and Data Analysis and Management sections. The Technical Services Section implements the department's various surface water quality monitoring programs and works cooperatively with the district offices and regulatory bureaus in the performance of special water quality investigations, such as those occurring in the aftermath of major pollutant spills, toxic algal blooms, and fish kills. The Data Analysis and Management Section maintains the Kansas surface water register, conducts statistical analyses of water quality data and other environmental data, and develops maps and other graphical materials on behalf of other sections, bureaus and offices within the division. District staff conduct compliance inspections of water and wastewater treatment plants, confined animal feeding operations, solid and hazardous waste handling, treatment and storage facilities, industrial emitters of air pollution, and other potential sources of pollution. They also investigate contaminant spills, fish kills, and other environmental emergencies and respond to citizen complaints and concerns about the environment. Each district office operates under the auspices of a district environmental administrator (DEA) who, in turn, reports to the district director in Topeka. An organizational chart illustrating the bureau's current administrative and QA hierarchy is presented in Appendix A. Figure 3-1, below, depicts the geographical placement and jurisdiction of the bureau's six district offices in relation to the central office.

Figure 3-1. Location of Bureau of Environmental Field Services central office (★) and district and satellite offices (●) and geographical jurisdictions of district offices.



3.2 Quality Assurance Responsibilities

Staff QA and QC expectations and responsibilities are described in detail in the individual QAPPs and SOPs comprising Part III of the QMP. The following paragraphs briefly summarize these expectations and responsibilities.

Bureau Director - This employee ultimately oversees the development, revision and implementation of the bureau QA management plan (Part II of QMP) and associated QAPPs and SOPs (Part III of QMP). With the assistance of the bureau QA representatives and section chiefs/DEAs, the bureau director ensures that QA requirements are fulfilled in the most cost effective manner possible without hindering attainment of the stated QA objectives. The bureau director prioritizes the training and continuing educational needs of staff and develops funding proposals to accommodate these needs, as necessary.

Bureau QA Representatives - These employees are directly responsible for reviewing and approving QAPPs and SOPs administered by the central and district offices. They provide guidance to program/project managers involved in the preparation and implementation of QAPPs and SOPs and operate under a degree of autonomy which allows them to make independent assessments of QA performance and the need for corrective action. The bureau QA representatives analyze QA evaluation reports and related information submitted by section chiefs/DEAs and program/project managers. They work with these supervisory staff and the divisional QA officer in the resolution of identified QA problems and concerns.

Section Chiefs and DEAs - These employees generally are responsible for more than one environmental monitoring program/project and may supervise other, front line supervisors such as program/project managers. They oversee the QA aspects of environmental monitoring programs/projects on an ongoing basis, identify QC deficiencies within their respective programs/projects, track the QC performance of staff, and participate in the periodic review and revision of the bureau QA management plan and associated QAPPs and SOPs. Section chiefs/DEAs communicate often with program/project managers to ensure that all applicable QA and QC requirements are routinely and correctly implemented.

Program/Project Managers - Managers of environmental monitoring programs/projects work closely with nonsupervisory staff to ensure that QAPP and SOP requirements are implemented in a timely, consistent and technically appropriate fashion. Together with the section chiefs and DEAs, these managers strive to improve the efficiency of environmental monitoring operations through the prudent, day-to-day allocation of staff and other resources. They also bring the QC training needs of staff to the attention of their section chiefs/DEAs, develop QAPPs and SOPs for new monitoring initiatives, and periodically review and revise existing QAPPs and SOPs to meet the evolving informational needs of the division.

Non-supervisory Staff - Individuals directly involved in the collection and analysis of environmental monitoring data play an important role in the implementation of the QMP. To a large extent, the quality and usefulness of the division's environmental monitoring data reflect the willingness of these individuals to abide by approved QAPPs and SOPs and to participate constructively in the ongoing review and revision of these documents. Because

they carry out the provisions of QAPPs and SOPs on a routine basis, non-supervisory staff often develop a keen understanding of the technical strengths and weaknesses of the bureau's environmental monitoring operations. Program/project managers and other supervisors are expected to solicit input from these employees when developing new or revised QAPPs and SOPs.

Section 4

QUALITY SYSTEM DESCRIPTION

4.1 Bureau Quality Assurance Management Plan

This document, the bureau QA management plan, establishes QA goals, policies, procedures, organizational responsibilities, evaluation and reporting requirements and other technical requirements applicable to environmental monitoring operations administered by BEFS. Pursuant to Part I of the QMP, this document must be reviewed at least annually and updated, if needed, by the bureau QA representatives. Whereas minor revisions to this plan are reviewed and approved by the bureau QA representatives and bureau director, major revisions, reflecting significant changes in the bureau quality management system, are reviewed and approved by the bureau QA representatives, bureau director, divisional QA officer, and division director. Changes constituting major revisions are identified by the bureau QA representatives in consultation with the divisional QA officer. Deviations in the bureau QA management plan from the overarching divisional policies set forth in Part I of the QMP are approved only under exceptional circumstances and must be clearly explained and justified within the plan.

4.2 Quality Assurance Program/Project Plans

A QAPP shall be developed for each environmental monitoring program/project by the responsible program/project manager and approved by the supervising section chief/DEA and appropriate bureau QA representative prior to the initiation of data collection. Most QAPPs and SOPs implemented by BEFS central office staff are developed by program/project managers within the Technical Services Section. Although district staff may occasionally develop QA documentation for specific environmental monitoring operations, most QAPPs and SOPs implemented at the district level are developed by program/project managers within the bureaus of Air, Environmental Remediation, Waste Management, and Water. District staff performing monitoring operations on behalf of other bureaus are expected to participate in the periodic review and revision of governing QAPPs and SOPs. In the unlikely event a QAPP or SOP implemented by BEFS is developed by an outside contractual entity, or by a regulated entity, the requirements of Part I, section 4.1, of the QMP shall apply.

Each QAPP shall be prepared using a standardized document control format in which the report identity, section number, revision number, date of revision, and page number appear in the upper right-hand corner of each page. Each QAPP shall contain the following informational elements unless the reviewing bureau QA representative determines that a given element falls outside the technical scope of the program/project:

(1) title page identifying program/project, bureau, division and agency;

(2) approval page with blocks for appropriate signatures and dates;

(3) table of contents, including a list of any appendices;

(4) overview of program/project, including statement of purpose, developmental history, and any relevant statutory and regulatory requirements;

(5) description (or chart) of organizational hierarchy with accompanying list of participating staff positions and statement of staff responsibilities;

(6) description of data performance criteria expressed in terms of data precision, accuracy, completeness, comparability and representativeness for each parameter of interest;

(7) description of, and rationale for, intended sampling frequency, sampling network design and monitoring site selection criteria;

(8) description of sampling equipment and associated decontamination procedures (reference SOPs, as appropriate);

(9) description of field procedures, including sample collection, analysis, preservation, transport and chain-of-custody procedures and accompanying safety protocols (reference SOPs, as appropriate);

(10) list of laboratory parameters and sample holding times and accompanying description of laboratory analytical and safety protocols (note: SOPs adopted by the Kansas Division of Laboratories or other cooperating laboratories may be adopted by reference, provided they contain the informational elements stipulated in section 4.3, below);

(11) description of data validation, storage, transfer, reporting and backup requirements and any special documentation requirements (reference SOPs, as appropriate);

(12) description of equipment testing, calibration and preventative maintenance procedures (reference SOPs, as appropriate);

(13) description of inspection procedures and acceptance requirements for purchased equipment and supplies (reference SOPs, as appropriate);

(14) description of procedures (including statistical procedures) used to evaluate data precision, accuracy, completeness, representativeness and comparability, including a detailed characterization of internal QC procedures and any external performance audit requirements;

(15) description of procedures used to evaluate and enhance utility of environmental monitoring data, including, but not necessarily limited to, procedures and assumptions applied in the identification and treatment of (a) outliers and other anomalous data, (b) nonlinear data requiring statistical transformation, and (c) values reported as “less than” or “greater than” established reporting limits;

(16) description of corrective action procedures for out-of-control situations;

(17) description of procedures for determining the quality of ancillary data acquired from external sources not subject to the provisions of the divisional QMP (e.g., meteorological, hydrological, geological, chemical and/or biological data obtained from other state or federal agencies); and

(18) description of program/project deliverables (electronic databases, summary statistics, illustrative materials, interim and final reports, etc.) and schedule for completion.

Additional points to consider when preparing a QAPP are presented in the EPA documents *Guidance for Quality Assurance Project Plans* (EPA QA/G-5) and *EPA Requirements for Quality Assurance Project Plans* (EPA QA/R-5).

4.3 Standard Operating Procedures

Standard operating procedures document protocols used in the collection, preservation, transport, transfer and analysis of environmental samples and in the collection, validation, storage, retrieval, transfer, backup and analysis of environmental data. As such, they facilitate consistency among staff, serve as valuable references and training tools, and provide formal written records of the methods used to implement environmental monitoring operations. All SOPs must be scientifically rigorous and compatible with the data performance criteria set forth in their respective QAPPs.

Approved SOPs may be appended to the end of a QAPP or adopted by reference within the text of a QAPP. All SOPs originating within BEFS shall employ a standardized document control format in which the report identity, section number, revision number, date of revision, and page number appear in the upper right-hand corner of each page. Elements to consider when preparing an administrative, field, or laboratory SOP are presented in the EPA document *Guidance for the Preparation of Standard Operating Procedures (SOPs) for Quality-Related Documents* (EPA QA/G-6). Each technical SOP involving field work and related sample and data collection activities shall contain the following informational elements, unless the reviewing bureau QA representative determines that a given element or combination of elements falls outside the technical scope of the environmental monitoring program/project:

(1) title page with appropriate blocks for approval signatures/dates;

(2) table of contents including a list of any appendices;

(3) introductory statement describing intended application of SOP and providing overview of procedure;

(4) statement of minimal technical qualifications for participating staff;

(5) instructions for calibrating field instruments and performing associated troubleshooting procedures;

(6) instructions for collecting, preserving and handling environmental samples and/or

performing environmental measurements, emphasizing health and safety considerations and highlighting any steps requiring special attention, patience or care;

(7) instructions for collecting and analyzing duplicate or replicate samples and for preparing field blanks, spikes and split samples, emphasizing health and safety considerations and highlighting any steps requiring special attention, patience or care;

(8) instructions for preparing and analyzing samples in the field and performing related troubleshooting procedures, emphasizing health and safety considerations, steps requiring special attention, patience or care, and possible interferences jeopardizing data quality;

(9) instructions for transporting, transferring and storing environmental samples and accompanying field data and records (e.g., written notes and logs, conventional and digital photographs, audio and audiovisual tapes), emphasizing chain-of-custody procedures, health and safety considerations, and steps requiring special attention, patience or care;

(10) description of data acquisition, storage, retrieval, transfer, verification, backup and analysis procedures, long-term data/records management procedures, and enabling computer hardware and software;

(11) glossary of technical terms and acronyms employed in SOP (often included as appendix); and

(12) checklist of applicable field equipment and supplies (often included as appendix).

4.4 Assessments of Program/Project Performance and Data Quality

Pursuant to Part I, section 4.3 of the QMP, individual monitoring programs/projects may be audited at any time by the divisional QA officer, bureau QA representative(s), federal oversight agency, or an independent third party contracted by the division or oversight agency. Bureau QA representatives and section chiefs/DEAs also are expected to conduct data quality assessments for environmental monitoring programs/projects, based on perceived need or according to schedules set forth in the approved QAPPs. The QA performance of any given monitoring program/project may also be assessed as part of an internal or external management system review (MSR) of the entire division. Staff shall cooperate fully with requests for information made in conjunction with these assessments, including but not limited to information on the adequacy of physical facilities, equipment, personnel, training, field and laboratory procedures, safety, record keeping, data validation and management, and other aspects of the specified monitoring program/project. If an assessment identifies the need for a corrective action, program/project managers shall bear primary responsibility for reviewing the available options, selecting the most favorable, and obtaining the approval of the applicable bureau QA representative and section chief/DEA prior to implementing the selected action. The implementation status of the corrective action shall be monitored by the supervising section chief/DEA and addressed in the end-of-year program/project evaluation reports

considered in section 4.6, below.

Quality control aspects of routine environmental monitoring operations are subject to ongoing review by the responsible program/project managers and supervising section chiefs/DEAs. Program/project managers are expected to cooperate fully with administrative requests for information on data precision and accuracy and overall QC performance. Section chiefs/DEAs are expected to track the QC and supervisory performance of program/project managers, assist these managers in identifying QC deficiencies within their respective programs/projects, and facilitate necessary corrective actions. Results of internal reviews conducted by section chiefs/DEAs shall be summarized in the annual program/project evaluation reports (section 4.6, below).

4.5 Staff/Supervisor Performance Evaluations

Position descriptions and performance evaluations shall reflect the QA and QC functions and performances of staff. All staff involved in environmental monitoring operations are expected to carry out their responsibilities under the QMP to the best of their abilities. Administrative staff and program/project managers are expected to foster an appreciation for the role of QA and QC among non-supervisory employees. In turn, the QA and QC opinions and insights of non-supervisory employees shall be carefully considered by program/project managers and administrative staff. The quality and credibility of the bureau's environmental monitoring efforts ultimately depend on the willingness of all employees to work as a team, learn from their mistakes, and continually strive for improvement.

4.6 Annual Program/Project Evaluations

End-of-year program/project evaluations shall be conducted by section chiefs/DEAs and the results submitted, in writing, through the appropriate bureau QA representative to the bureau director and divisional QA officer by February 15 of the following year. These written evaluations shall indicate when, how, and by whom the evaluations were conducted and describe the specific aspects of the programs/projects subjected to review. They shall include a summary of important findings and recommendations for any necessary corrective actions. Section chiefs/DEAs shall discuss these findings and recommendations with program/project managers and participating field, laboratory, and data management staff. Program/project managers shall cooperate with administrative requests for QA and QC data during the preparation and review of the written program/project evaluations.

Section 5

PERSONNEL QUALIFICATIONS AND TRAINING

5.1 Personnel Qualifications

Bureau staff involved in the collection, handling and analysis of environmental samples or in the collection, storage, retrieval, transfer and examination of environmental data must possess the minimum level of education, training and experience necessary to meet the demands of their position (as reflected in the class specifications for the job position or in the employee position description). The knowledge and skills possessed by staff and supervisory personnel strongly influence the quality of environmental monitoring data, the interpretation of these data, and the appropriateness of most administrative and regulatory actions taken by the agency.

5.2 Continuing Educational Opportunities

Methods employed in the collection and analysis of environmental samples and environmental data are subject to ongoing review and improvement. Occasional conceptual or technological breakthroughs may rapidly antiquate existing methods and require extensive training or retraining on the part of staff. Continuing educational courses offered by some colleges or vocational educational institutions may fulfill these training needs. The bureau may reimburse employees for course work and related expenses provided the course subject matter is within the general scope of the employee position description, funds for training have been set aside within the budget of the beneficiary program/project, requests for reimbursement have been approved prior to attending training, and participation is otherwise allowable under prevailing agency training and travel policies.

5.3 Quality Assurance Training

Bureau QA representatives are responsible for working with section chiefs/DEAs and program/project managers to ensure that all staff implementing QAPPs and SOPs are familiar with their responsibilities under the QMP and have received an appropriate level of QA training. As training opportunities and agency resources allow, section chiefs/DEAs and program/project managers are expected to complete the following (or equivalent) EPA training courses: *Orientation to Quality Assurance*, *Systematic Planning Process (Data Quality Objectives)*, *Quality Assurance Project Plans*, and *Standard Operating Procedures*. The bureau QA representatives are similarly expected to complete the above-mentioned courses and the following (or equivalent) EPA courses: *Quality Management Plans* and *Data Quality Assessments*. As resources and work priorities allow, other employees shall be encouraged to participate in QA training courses offered by EPA. Quality assurance training needs shall be addressed by section chiefs/DEAs in the end-of-year program/project evaluation reports discussed in section 4.6, above.

5.4 Supervisory Expectations

The quality of the bureau's environmental monitoring data is strongly influenced by the level of staff training, experience and preparation. Section chiefs/DEAs are expected to address the general training needs of staff within the annual program/project evaluation reports. This information is

incorporated annually into the BEFS budget prepared by fiscal staff and the bureau director. To broaden the experience of staff, supervisors may provide occasional opportunities for interested employees to participate in activities outside their daily work routines (i.e., cross training opportunities). Such activities must be within the general scope of the employee classification specifications and conform to the training requirements presented in sections 5.5 and 5.7, below.

5.5 New Employee Orientation

Supervisors shall ensure that new monitoring personnel, including newly hired employees and recent transfers or cross trainees from other programs/projects, receive a thorough indoctrination into the QA and QC policies and procedures of the division, the bureau, and the applicable program/project. The present document, together with Part I of the QMP and all applicable QAPPs and SOPs in Part III of the QMP, shall be required reading on the part of all such employees. Apart from QA and QC considerations, supervisors shall ensure that all new monitoring personnel participate in orientation and training seminars required by KDHE Human Resources. Similarly, new supervisory employees are expected to successfully complete the introductory training course for supervisors offered by KDHE Human Resources. Safety procedures shall be thoroughly reviewed before any new employee engages in a potentially hazardous duty. New employees must demonstrate a satisfactory understanding of safety issues before they are permitted by their supervisors to participate independently in any potentially hazardous activity (section 5.7).

5.6 Annual Review Affidavit

All bureau employees participating in environmental monitoring operations shall review the present document, in addition to Part I of the QMP and applicable QAPPs and SOPs in Part III of the QMP, at least once each year. Upon completion of this annual review, each employee shall sign an affidavit indicating he/she has read the appropriate QA documentation. The signed affidavit shall be routed through the immediate supervisor and bureau QA representative to the divisional QA officer. This review requirement shall be incorporated into the employee's written job expectations and factored by the immediate supervisor into the employee's annual performance evaluation.

5.7 Safety Considerations

Field and laboratory staff participating in monitoring programs/projects encounter potentially hazardous situations on a frequent basis. In addition to the routine possibility of automobile, boating or equipment accidents, employees may encounter slippery surfaces, toxic substances, fire or electrocution hazards, infectious microorganisms, vicious animals, belligerent persons, or other threatening situations. Injuries or illnesses resulting from such situations may lead to substantial human suffering and, from a QA and QC perspective, deprive monitoring programs/projects of the services of valuable employees. To minimize this risk, field and laboratory staff must observe all safety requirements set forth in applicable QAPPs and SOPs (sections 4.2 and 4.3, above) and in the Division of Environment Safety Policy.

Section 6

PROCUREMENT OF GOODS AND SERVICES

6.1 Procurement of Services

Contractual services involving the acquisition or analysis of environmental data shall be planned and controlled to ensure that these services meet applicable technical and QA requirements. All contracts for services shall require a QAPP to be developed by the outside contractor and submitted to BEFS (and any other participating bureaus) for review and approval prior to the initiation of data collection (section 4.2). Procurement of services shall comply with procedures described in the KDHE guidance notebook *Purchase Procedures and Payment Process*. Contracts shall reference or contain specific drawings, regulatory requirements, specifications, flow charts, codes, standards, standard methods, procedures and/or instructions that describe the services to be provided by the contractor. Contracts also shall specify minimal requirements for evaluating the suitability and acceptability of any data, reports or other deliverables stemming from the contractual agreement. Program/project managers shall be directly responsible for ensuring that deliverables meet the requirements stipulated in the contracts. Section chiefs/DEAs and bureau QA representatives are expected to assist program/project managers in resolving any questions relating to the QA and QC aspects of contractual services.

6.2 Procurement of Equipment and Supplies

The procurement of equipment and supplies (goods) for environmental monitoring operations shall be planned and controlled to ensure that the quality of obtained goods is documented and meets the technical requirements of the bureau and the division. Procurement of goods shall in all instances abide by the procedures described in the KDHE guidance notebook *Purchase Procedures and Payment Process*. Quality assurance specifications shall be clearly indicated in purchase orders or related procurement documents. As needed to comply with data performance criteria, reference shall be made in the procurement documents to specific regulatory requirements, specifications, codes, standards, methods, procedures, or instructions. The procurement documents shall specify minimal technical requirements for acceptance of goods by BEFS. Certificates of conformance shall accompany the delivery of chemical reference standards, calibration gases, calibration and reference equipment, and similar goods. Program/project managers (or their designees) shall ensure that all technical specifications are met before goods are accepted by BEFS. Section chiefs/DEAs and bureau QA representatives shall assist in these activities, as needed. This requirement does not apply to services, equipment and supplies purchased under statewide contracts developed by the Division of Purchases, Department of Administration, on behalf of state agencies.

Section 7

COMPUTER TECHNOLOGY

7.1 Computer Hardware and Software

All purchases of computer hardware and software must be approved in advance by the KDHE Office of Information Technology (IT) and abide by the purchasing requirements described in the KDHE guidance notebook *Purchase Procedures and Payment Process*. Anti-virus software approved by IT shall be installed and utilized on all BEFS laptop and desktop computers and any agency minicomputers and mainframe systems used for storage, retrieval, transfer, backup and/or analysis of environmental data.

7.2 Data Entry Requirements

Environmental data (and metadata) manually entered into a state or federal computer database by any BEFS employee shall be examined and verified by at least one other DOE employee familiar with the database. This process shall entail the selection of a representative, randomly selected sample of data and the documentation and correction of any data entry errors. The percentage of data subjected to review, the method of review, and the reviewer shall be specified in the applicable QAPP. Staff transferring data electronically shall perform random spot checks of the transferred data and report any problems to IT (or the external cooperating entity) for further investigation and resolution. Persistent or recurring problems also shall be reported to the appropriate supervisor and bureau QA representative for determination of necessary corrective actions. Such problems shall be addressed in the end-of-year program/project evaluation reports (section 4.6).

7.3 Verification of Calculations

Computer-based mathematical, statistical, graphical and geographical programs and models involving environmental data shall be tested before application and periodically thereafter. The reliability of software for performing calculations shall be tested by comparison to other computer programs, through hand calculations involving randomly selected data, or through other appropriate means. The reliability of computer-based calculations shall be verified according to schedules established in applicable QAPPs and whenever a problem is reported within the computational system. Quality assurance program/project plans shall describe the types of computer-based calculations to be performed and prescribe measures for monitoring the precision and accuracy of these calculations. This requirement may be waived in writing by the bureau director for specific applications involving commercial software after review by both the bureau director and appropriate bureau QA representative. Originals of these waivers shall be retained by the bureau QA representative with a copy forwarded to the divisional QA officer.

Section 8

DOCUMENTS AND RECORDS

Changes in the manner of environmental data procurement and in the quality of the data collected by BEFS shall be documented for future reference. The bureau QA representatives shall maintain a hard copy library of all current and historical QA management plans, QAPPs and SOPs administered by BEFS.

An electronic representation of the bureau QA management plan and associated QAPPs and SOPs shall be maintained on the KDHE internet server in a PDF "read only" format and made accessible to any interested employee or outside party. The bureau QA representatives are solely authorized and required to update this representation. In general, updates shall be made within 96 hours of approval of the hard copy revision. Only changes which have been formally approved pursuant to section 4.1 of this document shall be made to the master hard copy and electronic versions of the bureau QA management plan and associated QAPPs and SOPs.

Requirements for archiving environmental monitoring data and routine QC data shall be addressed, on a program/project specific basis, in the individual QAPPs. Managers of the various environmental monitoring programs/projects are expected to track QC performance over time and to alert their respective section chiefs/DEAs and the bureau QA representatives of any serious deviations from the historical norm or any failure to comply with established data performance criteria.

Section 9

PLANNING AND IMPLEMENTATION OF WORK

9.1 Planning Requirements

All bureau operations involving the generation and analysis of environmental monitoring data must be systematically planned and documented. The primary planning documents utilized by BEFS include the annual divisional budget, the performance partnership agreement with EPA, work plans associated with other federal grants/agreements, the Kansas surface water quality monitoring strategy, and the QMP. End-of-year program/project reports and the division's annual QA report also serve in a planning capacity by addressing staff training needs, pending corrective actions, and upcoming QA initiatives and assessments.

The QAPPs contained in Part III of the QMP constitute formal planning tools for both intramural and extramural environmental monitoring programs/projects. In developing a QAPP, the program/project manager is expected to obtain input from the person(s) originally requesting the monitoring data and/or representing the ultimate user(s) of the data. The program/project manager also is expected to solicit comments from field, analytical, data management, supervisory, and other staff likely to participate in the environmental monitoring program/project. Prior to implementation, each QAPP must be reviewed and approved by the supervising section chief/DEA for conformance with organizational work policies and priorities and by the appropriate bureau QA representative for conformance with applicable QA requirements. The EPA document *Data Quality Objectives* (QA/G-4) may be used by the program/project manager as a tool in the QAPP planning and development process.

9.2 Implementation Requirements

Environmental monitoring operations shall be implemented by qualified personnel based on approved QAPPs and SOPs. In the event of unforeseen contingencies, any deviation from approved procedures shall be documented and reported by the program/project manager to the supervising section chief/DEA and appropriate bureau QA representative. The significance of the deviation, and any needed adjustments or corrective actions, shall be determined by the section chief/DEA and bureau QA representative with input from the program/project manager and non-supervisory staff actually performing the work. Staff and supervisory expectations in the event of departure from approved procedures shall be addressed in the approved QAPP.

Section 10

ASSESSMENT AND RESPONSE

10.1 Assessments

Assessments are intended to strengthen management's understanding of the system being examined and to provide an objective basis for improving the system. Pursuant to section 4, above, environmental monitoring operations covered by this QMP are subject to internal and external assessments including, but not necessarily restricted to, audits, performance evaluations, MSRs, and data quality assessments. Primary assessment tools selected during the planning stages of a program/project shall be specified within the applicable QAPP and, at a minimum, subject to review and approval by the supervising section chief/DEA and appropriate bureau QA representative. Assessment findings, and any corrective actions taken in response to these findings, shall be summarized by section chiefs/DEAs in the end-of-year program/project evaluation reports discussed in section 4.6, above.

Bureau QA representatives and other BEFS employees called upon to assess the QA and QC performance of an environmental monitoring program/project must have a working familiarity with the technical and management operations performed within that program/project. They also must meet the minimum QA training requirements set forth in sections 5.1 and 5.3, above. These employees are granted the authority to...

(1) access records, data, and other forms of documentation needed to evaluate the QA and QC performance of the program/project;

(2) identify and document problems that diminish data quality;

(3) suspend work operations upon detection of a serious adverse condition impacting quality or the safety of staff or the general public;

(4) propose recommendations for resolving documented quality or safety problems; and

(5) independently confirm the effectiveness of any implemented corrective actions.

10.2 Corrective Actions

Within ten working days of the completion of an internal QA assessment, the assessor shall document, in writing, the need for any apparent corrective action and share this information with the program/project manager, supervising section chief/DEA, appropriate bureau QA representative, bureau director, and divisional QA officer. Within thirty working days of receipt of this notification, the program/project manager shall prepare a written response detailing his/her chosen course of corrective action and presenting a schedule for implementing this action. Copies of this response shall be forwarded to the supervising section chief/DEA, appropriate bureau QA representative, bureau director, and divisional QA officer. The section chief/DEA and bureau QA representative shall be responsible for reviewing, approving, and monitoring the implementation of the chosen

corrective action. Corrective actions implemented during the preceding calendar year or scheduled for the upcoming calendar year shall be summarized for each program/project in the end-of-year program/project evaluation reports prepared by the section chiefs/DEAs (section 4.6).

Copies of program/project QA audit reports prepared by external assessment entities shall be distributed by recipient staff to the appropriate program/project manager, supervising section chief/DEA, appropriate bureau QA representative, bureau director, and divisional QA officer. Disputes concerning external audit findings and the need for corrective action shall be resolved at the lowest practicable organizational level. Disputes still unresolved after an interval of thirty working days may require intervention by the divisional QA officer and/or division director. Prior to intervention, the divisional QA officer or division director shall notify and consult with the appropriate bureau QA representative and the bureau director. Upon divisional resolution and/or acceptance of external audit findings, the program/project manager shall prepare a written response within thirty working days detailing his/her chosen course of corrective action and providing a schedule for implementing this action. Copies of this response shall be forwarded to the supervising section chief/DEA, appropriate bureau QA representative, bureau director, and divisional QA officer. The section chief/DEA and bureau QA representative shall be responsible for reviewing, approving, and monitoring implementation of the chosen corrective action. Corrective actions implemented during the preceding calendar year or scheduled for the upcoming calendar year shall be summarized for each program/project in the end-of-year program/project evaluation reports prepared by the section chiefs/DEAs (section 4.6).

In accordance with Part I of the QMP, MSR reports submitted by external assessment entities shall be distributed by the divisional QA officer to the division director, the bureau director, and the appropriate bureau QA representative. If a need for corrective action is indicated within an MSR report, a written response shall be prepared by the divisional QA officer within thirty working days and submitted to the division director for review and approval. The bureau QA representative and bureau director shall be provided an opportunity to comment on the proposed response prior to its finalization and forwarding to the external assessment entity.

Section 11

QUALITY IMPROVEMENT

Previous sections of this document have discussed specific mechanisms for bringing about the continual improvement of the bureau quality management system. These mechanisms include, but are not necessarily limited to, QA planning requirements (sections 4, 9), internal and external quality assessments (sections 4, 10), employee training requirements and continuing educational opportunities (section 5), performance feedback requirements (sections 3, 4), corrective action procedures (section 10), and end-of-year program/project evaluations (sections 3, 4, 5, 7, 10). This section addresses two additional mechanisms for ensuring continual improvements in the quality management system: the ongoing review and revision of the QMP itself, and the regular communication of QA and QC concerns and recommendations among bureau staff.

11.1 Quality Management Plan Review

At approximately yearly intervals, the bureau QA representatives shall review the bureau QA management plan, formulate any needed major revisions, and obtain the approval of the bureau director, the divisional QA officer, and the division director. Similarly, each program/project manager shall review those QAPPs and SOPs administered under his/her purview, formulate any needed revisions, and obtain the approval of the supervising section chief/DEA and appropriate bureau QA representative.

Minor revisions to the bureau QA management plan do not require review and approval beyond the bureau QA representatives and bureau director. Questions regarding the appropriateness of an abbreviated review/approval process are resolved by the bureau QA representatives in consultation with the divisional QA officer. Annual activities related to the review, revision and approval of the bureau QA management plan and associated QAPPs and SOPs normally follow the completion and submission of the program/project evaluation reports in February. However, revisions to these documents may be implemented at any time based on urgency of need or staff workload considerations. All approved revisions are subject to the documentation, tracking, and record keeping requirements of section 8, above.

11.2 Quality Assurance Communication

The bureau QA representatives shall meet with the divisional QA officer at least quarterly to review and discuss QA initiatives, training/resource needs, assessments, corrective actions, and other issues relevant to the divisional and bureau quality management systems. Any critical information exchanged during these meetings shall be communicated to bureau supervisory personnel by the bureau QA representatives. Section chiefs/DEAs and program/project managers are expected to meet with non-supervisory staff on a regular basis to obtain feedback on QA and QC issues and to relate this feedback to their bureau QA representatives.

In addition to the regularly scheduled meetings considered above, all environmental monitoring personnel are encouraged to communicate openly and often on QA and QC issues and to express any concerns or recommendations to their immediate supervisors, bureau QA representatives, and/or the

divisional QA officer. An ongoing exchange of thoughts and opinions on these issues encourages the timely recognition of needed areas of improvement and is a hallmark of a healthy quality management system.

APPENDIX A
ADMINISTRATIVE AND QUALITY ASSURANCE STRUCTURE OF
BUREAU OF ENVIRONMENTAL FIELD SERVICES