



TASK 2: QUALITY ASSURANCE

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See CRP web site for QAPP Shell and related documents at www.texascleanrivers.org select *Program Resources* then *Quality Assurance*

TASK 2: QUALITY ASSURANCE

Introduction

Quality assurance (QA) is an integrated system of management activities involving planning, implementation, assessment, reporting, and quality improvement to ensure a process is of the type and quality needed and expected by the customer. The focus on this definition provides this task's rationale as it relates to project planning, oversight, and corrective action.

Systematic project planning is central to an integrated quality assurance approach and is fundamental to the success of water quality monitoring projects conducted under the Clean Rivers Program (CRP). It is a process that considers:

- project objectives
- measurement performance specifications
- appropriate methods
- field and laboratory quality control
- data management
- verification and validation of data
- oversight
- corrective action

Quality Assurance Project Plans (QAPPs) will continue to be used by the CRP to plan, organize, and define its quality assurance process in order for data to be collected with the level of reliability needed for decision-making. Although QAPPs for the CRP do not require Environmental Protection Agency (EPA) approval, the Texas Commission on Environmental Quality (TCEQ) requires that data collection under the CRP be comparable to other data collected by the TCEQ and be consistent with EPA requirements.

CRP QAPPs do not apply to and should not be used for data collection for federally funded programs or projects. A standalone QAPP should be developed and approved by the appropriate TCEQ staff.

Contract Provisions

Certain key components related to quality assurance are essential to the collection of valid data and ensure, to the greatest extent possible, that data produced by the CRP will be of the type and quality necessary for its intended use. These critical components represent the three key aspects of quality assurance: planning, implementation, and oversight. Due to the significance of these factors, the following provisions have been incorporated into the CRP contract and/or the Work Plan:

All work funded by this Agreement that involves the acquisition of environmental data generated from direct measurement activities, collected from other sources, or compiled from computerized data bases and information systems shall be planned in consultation with the TCEQ and be documented in a



fully approved TCEQ Quality Assurance Project Plan (QAPP) before data collection can be implemented. If this Agreement contains Federal Conditions, the QAPP must be approved by the U.S. Environmental Protection Agency (EPA) Project Officer in compliance with the Federal Conditions of this Agreement.

The GRANTEE shall ensure laboratory data is produced by laboratories (and subcontract laboratories) that are National Environmental Laboratory Accreditation Conference (NELAC)-accredited according to Texas Water Code Chapter 5, Subchapter R (TWC §5.801 et seq) and Title 30 Texas Administrative Code Chapter 25, Subchapters A and B.

If this Agreement is funded pursuant to the Texas Clean Rivers Program, the GRANTEE must perform on-site assessments of field monitoring activities for all sub-participants and/or subcontractors at least once during the Contract Term, for on-going projects, or once during the project's lifetime, for short-lived projects.

Project Planning

Special study and permit support monitoring projects to be conducted during FY 2012-2013 should be thoroughly discussed with TCEQ staff and all applicable parties before the work plan is finalized. If Basin Planning Agencies intend to conduct multiple special projects under subcontract, they should carefully consider staggering projects over the biennium, with consideration of variable funding. Sufficient time should be allocated to properly plan and execute the QAPP prior to data collection and reporting. Certain projects (or components of projects such as report writing) can be carried into the subsequent biennium to allow for adequate data collection. This should be determined prior to the execution of the work plan. Considerations for designing monitoring plans can be found in Task 3 – Monitoring.

A formal project planning process has many benefits:

- It optimizes data collection efforts by promoting communication and input from all involved parties.
- It ensures that data collected are of the type and quality appropriate to their intended use; and therefore, support decision making.
- It maximizes the use of existing data.
- Conditions for data management will be specified, such as data coding, verification and validation, manipulation, and transfer.
- Agreements reached during the process will determine the information to be documented in the QAPP appendix, expediting review and approval so projects can begin in a timely manner.

Basin Planning Agency Project Managers should contact their CRP Project Managers to indicate their intent and desire to conduct a planning meeting. A planning meeting should be conducted 90 days prior to the planned sampling date. After a date has been agreed upon, the CRP Project Manager will make the Agency contacts.



The objective of the project planning meeting is to implement a systematic planning process based on the Sections of the QAPP. The information developed during the planning meeting will be incorporated into a QAPP.

The Basin Planning Agency Project Manager will play the lead role in respect to planning projects and will:

- establish the planning team in consultation with the TCEQ
- schedule meetings
- distribute meeting materials in advance of the meeting
- facilitate the meetings
- prepare meeting minutes

Meeting preparation materials should include a proposed scope of work with maps of the study area (**Do not begin drafting the QAPP until after the meeting**). Meetings may be conducted in Austin, at the Basin Planning Agency, or via conference call, and will usually take 1-2 hours. The outcome of the planning meeting should be a set project goal and objectives along with an idea of how the data should be coded for entry into SWQMIS. A QAPP should be developed within 30 days after the meeting. The detailed meeting minutes serve as the deliverable for this task.

Approval to Conduct Work

As stated in the contract, all work funded by the contract that involves the acquisition of environmental data generated from direct measurement activities, collected from other sources, or compiled from computerized data bases and information systems shall be implemented in accordance with an approved QAPP except under limited conditions described below.

Lapses in Basin-wide QAPP coverage sometimes occur due to time constraints in getting updated QAPPs fully approved and distributed at the beginning of a new two-year contract cycle. When a QAPP is due to expire, if no changes are being made to the next QAPP other than to the monitoring schedule, and the new monitoring schedule has already been approved, then the Basin Planning Agency may request authorization to proceed with the monitoring plan conditionally under the existing QAPP until the new QAPP is approved and distributed.

To obtain conditional approval, the Basin Planning Agency Project Manager must submit an e-mail request to the CRP Project Manager prior to the expiration date of the existing QAPP. The CRP Project Manager, with the concurrence of the TCEQ CRP Program Manager and the Lead Quality Assurance Specialist (QAS) may grant approval for a maximum of 90 days beyond the expiration date of the existing QAPP.

Project Oversight

In order to ensure that data collection is conducted as planned and environmental monitoring projects are successful, a process of oversight and evaluation is necessary. Adequate oversight and evaluation of projects ensure that:

- work is accomplished as planned
- data quality is adequate
- corrective actions, when needed, are implemented effectively

Project oversight requirements should be documented in Section C1, Assessment and Response Actions, of the QAPP.

Basin Planning Agency Oversight Requirements

Basin Planning Agencies are required to oversee the activities addressed in their QAPPs and must conduct formal oversight of all sub-participants who conduct field monitoring.

Two types of field monitoring oversight are acceptable: 1) readiness reviews and 2) monitoring systems audits. Both of these activities should be performed on-site at least once during the contract cycle in the case of on-going projects, or once during a project's lifetime in the case of short-lived special studies. (This requirement does not apply if all work is performed by the Basin Planning Agency.) The type and timing of oversight activities will be negotiated during project planning and will be documented in the QAPP.

Basin Planning Agencies are also tasked with conducting status monitoring which involves the continual evaluation of programs or projects to ensure they are being conducted as planned and documented. Oversight activities are described in the following sections.

Basin Planning Agencies should document oversight activities in quarterly progress reports.

Readiness Review

A readiness review involves an evaluation to determine if all components of the project are in place so that work can begin. Readiness reviews are the preferred type of assessment activity to detect deficiencies so that corrective actions can be taken prior to initiation of data collection activities. The process is designed to evaluate the performance or effectiveness of the sampling process from collection through final reporting of the results, including (as applicable):

- required documentation
- adequacy of facilities and equipment
- instrument calibration procedures and logs
- field measurement protocols
- sample collection protocols
- biological sampling protocols

- sample handling and analysis protocols
- data verification and validation protocols and records
- data management protocols

The Monitoring Systems Audit Checklist is available electronically on the CRP web page at www.texascleanrivers.org in the *Program Resources --> Quality Assurance* section. The checklist should be modified to accommodate a readiness review. To conduct a readiness review, the reviewer must be familiar with the QAPP, field standard operating procedures, and data management protocols.

Monitoring Systems Audit

A monitoring systems audit is a thorough and systematic technical systems audit which involves an on-site qualitative review of activities related to monitoring and during which facilities, equipment, personnel, training procedures, and data management, and record keeping are examined for conformance to the requirements of the QAPP. The goal of a monitoring systems audit is to verify that applicable elements of the quality system are appropriate and have been developed, documented, and effectively implemented in accordance with project and program specifications. Assessments add value to a quality system by promoting and supporting continuous improvement. The audit process is designed to evaluate the sampling process from collection through final reporting of the results to include the same types of activities/processes looked at during a readiness review and can be performed at any time during the lifetime of a monitoring program or project. A data traceability exercise is an effective way of evaluating the sampling process from collection through final reporting. A copy of the data traceability/file review form can be found on the CRP web page at www.texascleanrivers.org in the *Program Resources --> Quality Assurance* section.

The Planning Agencies are tasked with ensuring that any laboratory generating data for the CRP is audited by its laboratory quality assurance staff for conformance to laboratory SOPs, applicable methods, and other specific requirements defined in the applicable QAPP and in its quality system standard. At a minimum, Planning Agencies should conduct a limited review of laboratory operations associated with verifying that the laboratory is following the QAPP specifications and is providing the needed information for verifying and validating data on a regular basis. This limited-scope review/audit should be performed so that the laboratory-client communications and understanding of client requirements is well defined and adequately followed.

The Monitoring Systems Audit Checklist is accessible electronically, see link in paragraph above. The checklist should be adapted as necessary based on the audit scope.

Report and Response

Following either a readiness review or a monitoring systems audit, the auditor must provide the audited organization with a report within 30 days. If no deficiencies are identified, then the report should state such. If deficiencies are identified, they must be reported as “findings” in the report. Audit reports should reference specific requirement(s) in the QAPP or in SOPs and should not be general in nature. Additional information regarding the justification of findings may be included along with observations. The audited organization should be asked to respond to the report in writing within 30 days regarding:

- the root cause of the deficiency
- the effect, if any, on any previously completed or current work
- proposed corrective action(s) to correct the deficiency
- action(s) planned to prevent recurrence of the deficiency
- date that each action will be, or was completed

A copy of the audit report and the response must be submitted as a deliverable to the CRP Project Manager with the progress report no later than the quarter following the one in which the audit was conducted.

Status Monitoring

Status monitoring involves the continual evaluation of programs or projects to ensure they are being conducted as planned and documented in the QAPP. This type of oversight is specified in the QAPP to ensure that CRP Project Managers perform a continual review of quality assurance activities over the course of the biennium. This type of monitoring may be a formal management review or a less formal review of QA activities. At a minimum, the Planning Agency Project Manager should request a written status of QA activities from staff on a quarterly basis. This includes, but is not limited to Laboratory NELAC Accreditation Status, Deficiencies, and Corrective Actions.

Corrective Action Process for Deficiencies

Planning Agencies are asked to address issues that may affect data quality. Definitions are in place to help Planning Agencies track, address, and report issues effectively without imposing unnecessary requirements.

Any deviation from the QAPP, SWQM Procedures, SOPs, or Data Management Reference Guide is a deficiency. Deficiencies may invalidate resulting data and may require corrective action. Corrective action may involve discarding samples and collecting replacement samples. Deficiencies are documented in logbooks, field data sheets, etc. by field or laboratory staff. It is the responsibility of the Planning Agency Project Manager, in consultation with the Planning Agency QAO, to ensure that the actions and resolutions to the problems are documented and that records are maintained in accordance with this QAPP. In addition, these actions and resolutions will be conveyed to the CRP Project Manager both verbally and in writing in the project progress reports and by completion of a corrective action plan (CAP).

Planning Agencies must address deficiencies associated with:

- sampling method or design (e.g. samples not preserved in the field)
- sample tracking procedures (e.g. hold times for bacteria samples expired; bacteria samples not collected in sterile bottles)
- analytical method requirements (e.g. post calibrations not performed)
- quality control requirements or acceptability requirements (e.g. blank contamination)

Corrective Action Plans should:



- Identify the problem
- Identify immediate remedial actions if possible
- Identify the underlying cause(s) of the problem
- Identify whether the problem is likely to recur, or occur in other areas
- Evaluate the need for Corrective Action
- Use problem-solving techniques to verify causes, determine solution, and develop an action plan
- Identify personnel responsible for action
- Establish timelines and provide a schedule
- Document the corrective action

To facilitate the process a flow chart has been developed (See Exhibit 2A: Corrective Action Process for Deficiencies). A form has been developed for the Planning Agencies to document corrective actions. The form can be accessed electronically at (www.texascleanrivers.org select *Program Resources* then *Quality Assurance*) and in Exhibit 2C of this document. Planning Agencies may choose to use the forms provided or devise their own system and set of forms.

After Corrective Actions have been completed, these follow-up activities should occur at the Planning Agency:

- Status monitoring
- Periodic review of documentation about the corrective actions
- Determining the effectiveness of the corrective actions

The status of CAPs will be included in quarterly progress reports (see Exhibit 2B: Status of Corrective Actions Table). Deficiencies leading to data loss should also be communicated on Data Summaries.

Data Review, Verification, and Validation

A good, well-defined, documented system of data review is very important to ensure the validity of data that are submitted to the TCEQ. This activity has been emphasized in past Guidance documents and will continue to be emphasized during the FY 2012-2013 biennium. For the purpose of reviewing data, the CRP will continue to define and recognize the two terms **verification** and **validation** as they are part of NELAC terminology. Verification is confirmation by examination and provision of evidence that specified requirements have been met. It refers to the data review processes used to determine data completeness, correctness, and compliance with technical specifications contained in applicable documents (e.g. QAPPs, SOPs, QAMs, analytical methods, NELAC Accreditation). Validation is the confirmation by examination and provision of objective evidence that the particular requirement for a specific intended use is fulfilled. It refers to a specific review process that extends the evaluation of a data set beyond method and procedural compliance (i.e., data verification) to determine the quality of a data set specific to its intended use.

All data obtained from field and laboratory measurements must be reviewed and verified for conformance to technical criteria and then validated against performance specifications and/or Data



Quality Objectives (DQOs). Only those data which are properly supported by appropriate QC data and which meet applicable project specifications and/or DQOs will be considered acceptable for reporting to the TCEQ for entry into the SWQMIS.

The Planning Agency will delineate the specifics of data review in Section D1 of the QAPP and specify responsible parties. Generally speaking, there are levels of review to be performed by field staff and by laboratory staff. The field data review tasks are usually performed by field staff and the laboratory data review tasks are usually performed by laboratory staff. The rest of the tasks are performed after the field and laboratory data are combined into a data set and depending on the situation are performed initially by sub-participant Data Managers or QAOs, and then by the Planning Agency Data Managers or QAOs.

To facilitate the review of data by the various parties, it is helpful to develop and use checklists that address the various levels of review (see Table 1: Verification and Validation Tasks). Checklists should be developed for the review of field data that incorporate the various requirements defined in the *Surface Water Quality Monitoring Procedures (RG-415)* and in the QAPP so that the data review tasks associated with field data can be accomplished. Likewise, checklists should be developed for the review of lab data. Similarly, the Planning Agency should prepare a checklist for use in reviewing the data after the data set is assembled that speaks to the usability of the data.

If any requirements or specifications of the QAPP are not met, based on any part of the data review, the responsible party should document the deficiencies and submit the information to the Planning Agency with the data. In turn, this information must be communicated to the TCEQ by the Planning Agency in the Data Summary.

Aspects of data management such as formatting and report generation to facilitate “data validation” are discussed in Task 4.



Table 1: Verification and Validation Tasks

Task	Field Task	Laboratory Task	Submitting Entity Data Manager Task
Sample documentation complete; samples labeled, sites identified	✓	✓	
Field QC samples collected for all analytes as prescribed in the TCEQ <i>SWQM Procedures Manual</i>	✓		
Standards and reagents traceable	✓	✓	
Chain of custody complete/acceptable	✓	✓	
NELAC Accreditation is current		✓	✓
Sample preservation and handling acceptable	✓	✓	
Holding times not exceeded	✓	✓	
Collection, preparation, and analysis consistent with SOPs and QAPP	✓	✓	✓
Field documentation (e.g., biological, stream habitat) complete	✓		
Instrument calibration data complete	✓	✓	
Bacteriological records complete	✓	✓	
QC samples analyzed at required frequency	✓	✓	✓
QC results meet performance and program specifications	✓	✓	✓
Analytical sensitivity (Limits of Quantitation/Ambient Water Reporting Limits) consistent with QAPP		✓	✓
Results, calculations, transcriptions checked	✓	✓	
Laboratory bench-level review performed		✓	
All laboratory samples analyzed for all parameters		✓	
Corollary data agree	✓	✓	✓
Nonconforming activities documented	✓	✓	✓
Outliers confirmed and documented; reasonableness check performed			✓
Dates formatted correctly			✓
Depth reported correctly			✓
TAG IDs correct			✓
TCEQ ID number assigned			✓
Valid parameter codes			✓
Codes for submitting entity(ies), collecting entity(ies), and monitoring type(s) used correctly			✓
Time based on 24-hour clock			✓
Absence of transcription error confirmed	✓	✓	✓
Absence of electronic errors confirmed	✓	✓	✓
Sampling and analytical data gaps checked (e.g., all sites for which data are reported are on the coordinated monitoring schedule)	✓	✓	✓
Field QC results attached to data review checklist			✓
Verified data log submitted			✓
10% of data manually reviewed			✓



TCEQ Oversight Requirements

TCEQ Laboratory and Monitoring Systems Audits

The TCEQ will continue to oversee Planning Agency activities by performing laboratory and monitoring systems audits of Planning Agencies as determined by a risk-based assessment.

Laboratory Audits of CRP participant laboratories are performed biennially by TCEQ Laboratory Inspectors. The audits assess compliance with NELAC standards, and include reviews of facilities, equipment, record-keeping, chain-of-custody records, adherence to approved QA planning documents, and SOPs. The CRP Project Manager, Project QA Specialist, and/or Lead QA Specialist may provide input into this process if deemed appropriate by the Laboratory Inspector. Checklists are used to guide the conduct of the audits.

The results of audits are documented in audit reports and sent to the auditees, CRP management, agency QA management and the appropriate Regional Director within 30 days of the site visits. If audits identify problems requiring corrective actions, the auditees provide written responses to the laboratory inspector addressing corrective actions within 30 days of receipt of the audit reports. Copies of laboratory inspection letters and audit reports are forwarded to the CRP Lead QA Specialist; auditee responses are sent to the CRP Lead QA Specialist upon request. Audit findings are reported to upper management (Section Manager and above) if significant corrective action is needed. Otherwise, audit reports are maintained by the QAWG which is a TCEQ quality assurance workgroup.

Monitoring Systems Audits conducted by the TCEQ will be determined after a risk assessment has been conducted and results ranked. Audits by the TCEQ will be conducted systematically so that all Planning Agencies and laboratories performing work for CRP will be assessed within a three-to-five year period, or more frequently, depending upon several factors (e.g., number of requests for audits, risk factors, findings from previous audits).

Specific CRP Laboratory Requirements

Ambient Water Reporting Limits (AWRLs)

For surface water to be evaluated for compliance with Texas Surface Water Quality Standards (TSWQS) (30 TAC §307.1 - 307.10) and screening levels, data must be reported at or **below** specified levels. To ensure data are collected at or below these levels, required reporting specifications (AWRLs) were established early in the CRP.

A workgroup was established in the summer of 2001 to ensure reporting limit requirements were properly aligned with the TCEQ's data needs. To set AWRLs appropriately, the workgroup first looked at how data would be compared against the TSWQSs. Ultimately, the lowest standard or screening level was used to set each AWRL at a meaningful level. The parameters for which AWRLs have been established are available electronically (see www.texascleanrivers.org and click on *Program Resources > Quality Assurance*).

While the AWRL is the program-defined reporting specification for each analyte, most laboratories report data based on the concept of a limit of quantitation (LOQ). A limit of quantitation (is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The following requirements must be met in order to report results to the CRP:

- **The laboratory's LOQ for each analyte must be at or below the AWRL as a matter of routine practice**
- **The laboratory must demonstrate its ability to quantitate at its LOQ for each analyte by running an LOQ check sample for each analytical batch of CRP Samples analyzed.**
- **The requirements for lab control check samples are described in Section B5 of the QAPP shell.**

The laboratory should be instructed to analyze a calibration standard (if applicable) at the LOQ on each day CRP samples are analyzed. Two acceptance criteria **must** be met: (1) Calibrations (including the standard at the LOQ) must meet the calibration requirements of the analytical method, and (2) The laboratory will analyze an LOQ check sample **for each analytical batch of** CRP samples analyzed.

For certain parameters that are routinely reported close to the LOQ, Laboratory Control Samples (LCS) should be run at the LOQ. These parameters include nutrients and metals in water.

Authorized Laboratory Methods

Analytical methodologies under the CRP are specified in the TSWQS. The TSWQS mandate that procedures for laboratory analysis will be in accordance with:

- the most recently published edition of the book entitled *Standard Methods for the Examination of Water and Wastewater*
- the latest version of the *Surface Water Quality Monitoring Procedures (RG 415 and RG 416)*
- 40 Code of Federal Regulations (CFR) Part 136
- other reliable procedures acceptable to the Agency

Changes to 40 CFR §136 became effective March 12, 2007. These changes allow the use of 189 updated methods from the 19th and 20th editions of *Standard Methods* in addition to the methods approved earlier for use. Requirements for analytical methodologies are specified in the QAPP shell document.

Statistical Control of Precision and Bias

Analytical laboratories must have a statistical process in place to review results as applicable to control on-going performance. To generate data for the CRP, the laboratories' control limits must be set and controlled within the bounds set by the measurement performance specifications for laboratory control samples (LCS) and LCS/LCS duplicates as defined in Table A7 of the QAPP.



The most common method of statistical process control involves the use of control charts as described in *Standard Methods for the Examination of Water and Wastewater* or the *EPA Handbook for Analytical Quality Control in Water and Wastewater Laboratories*. (Computer-generated lists or databases with values, limits, and trends may be used as an alternative to control charts.)

Laboratory Test Reports

Laboratory test reports (if applicable for routine water quality data analysis) should be clear, unambiguous and, at a minimum, contain the information specified in the NELAC Standards. The information required by NELAC with test reports is required even if the data are transmitted from the laboratories in event result format unless the laboratory has valid reasons for not doing so. In addition to the specified information, test reports for the CRP should include project-specific quality control results such as equipment, trip, and field blank results, bacteria holding time, as applicable. It is important for laboratories to provide narrative information about why results were not compliant with specifications as stated in the "Laboratory Data Review" section. Without this information, Basin Planning Agency data management staff cannot verify and validate data and provide required information on the Data Summary when data are submitted to the TCEQ. Copies of test reports will be reviewed during monitoring systems audits. Information regarding standard test report format is contained in the QAPP shell document. Additional information may be requested.

Laboratory Data Review

The laboratory's role in the review of CRP data is very important. At a minimum, all laboratory data must be reviewed (as described under "**Data Review, Verification and Validation**" in this Task). Laboratories should have SOPs in place to ensure data are free from transcription and calculation errors, all quality control measures are reviewed and evaluated, and project specifications are met. Laboratory data review records must be signed and dated by the analyst reviewer(s) and/or the Laboratory QA Officer.

The use of data review checklists by the laboratory is encouraged. If any requirements or specifications are not met, based on the data review, the laboratory should document the deficiencies and submit the information in the report narrative to the Planning Agency with the data. In turn, this information must be communicated to the TCEQ by the Planning Agency in the Data Summary.

Quality Assurance Project Plans

The development and implementation of a QAPP help to ensure:

- all projects use a planned approach, and that objectives, roles, and responsibilities of the participants are defined
- all aspects of measurement systems are defined and appropriate
- project oversight is adequate
- data verification and validation procedures are specified, thus enabling reconciliation with data quality objectives



Shells have been provided for all CRP QAPP documents and can be accessed electronically (www.texascleanrivers.org select *Program Resources > Quality Assurance*). The use of shell documents has streamlined the CRP QAPP preparation, review, and approval processes.

Much of the shell language represents CRP and/or TCEQ requirements. Language in standard text format is provided as an example. The language should be modified to reflect **actual** activities. Please discuss changes with the TCEQ CRP Project Manager. Information to be provided by the Planning Agency is provided in highlighted text. Italicized instructions are provided for the various sections and should be deleted from the document before it is submitted to the TCEQ.

The first draft of the QAPP should be submitted electronically. The TCEQ will send the first round of comments in a table. Responses to each TCEQ comment should be submitted noting how the comment was addressed in the column marked "Response". The review and approval of proposed amendments to the QAPP may be expedited if two versions of the document are submitted. One version should include highlights and strike-outs to show changes to the document, the other should have the highlights and strike-outs removed.

Biennial Submittal of Basin-Wide QAPPs

Draft basin-wide QAPPs should be sent electronically to the TCEQ CRP Project Manager on June 15 prior to the start of the new biennium. Review comments will be sent to the Planning Agency Project Manager within approximately 30 days of QAPP receipt. The Planning Agency must modify and resubmit the document within 30 days. The final basin-wide QAPP is due by August 15, 2011 for FY 2012/2013 and August 15, 2013 for FY 2014/2015.

Data Collection Procedures

The TCEQ *Surface Water Quality Monitoring Procedures (RG-415 and RG-416)* (www.tceq.state.tx.us/compliance/monitoring/water/quality/data/wqm/mtr/swqm_procedures.html) describes field procedures used for surface water sampling and biological collection for the purpose of submitting data to TCEQ. The QAPP states that the most recent version of the *Surface Water Quality Monitoring Procedures* must be used, including any updates made between revisions. If other SOPs apply, they should be referenced in the QAPP, as appropriate. SOPs should not be submitted with the QAPP for TCEQ review (unless specifically requested) but should be available to sampling staff and accessible for review by TCEQ staff during an audit.

QAPP Maps

Maps must be included in the QAPP and amendments that involve changes to sampling sites. QAPP maps need to include and label: sampling sites covered under the QAPP, streams/reservoirs, major roads, and cities.

Approval, Signature, and Distribution of Basin-Wide QAPPs

After the TCEQ has given approval of the QAPP, **three** copies of the document should be signed by the Planning Agency based on the designated signatures on the QAPP shell and sent to the TCEQ for signature. An electronic copy of the QAPP should be submitted to the TCEQ CRP Project Manager in



addition to the hard copies. We ask that you provide an electronic copy of the QAPP in case changes need to be made during sign off. The TCEQ will retain two signed copies of the QAPP. The Planning Agency may send additional signature pages it would like to be signed by the TCEQ, if necessary. A final copy will be uploaded to SWQMIS to be accessed by users in addition to the raw data.

Required signatures are designated on the Basin-wide QAPP shell document. Additional signatures can be added as needed (e.g. subparticipants). In FY2008, the requirement for lab sign off on QAPPs was added to insure that laboratories were involved in the development of QAPPs. The Planning Agency must distribute the QAPP to all participants and sub-participants. (Note: The TCEQ Lead QA Specialist will distribute copies to the TCEQ personnel indicated on the distribution list.) The Planning Agency will secure a receipt and commitment letter from sub-participants of its QAPP stating the sub-participants' receipt of the document and commitment to requirements contained in the QAPP.

(Note: Commitment letters are not required for entities who sign off on the QAPP) An example letter is provided in the QAPP shell document. This QAPP documentation should be maintained as part of the project's quality assurance records. **Copies of all commitment letters must be forwarded to the TCEQ no later than 60 days of TCEQ approval of the QAPP but prior to the monitoring event.**

QAPP Appendices

Appendices are prepared to itemize additional work or projects not initially described in the original QAPP. The appendices are planned by Planning Agency Project Managers in coordination with TCEQ CRP Project Managers, the Project QA Specialist, the Lead QA Specialist and other technical specialists (laboratories, consultants, other agency water programs, etc.) as appropriate. Note: the CRP QAPP shell does not apply to and should not be used for data collection for federally funded programs or projects. A standalone QAPP should be developed and approved by the appropriate TCEQ staff.

Special Study or Permit Support Monitoring

These QAPP appendices are designed to incorporate special study or permit support monitoring projects into the QAPP as they are planned. Although QAPP appendices are designed to be attachments to the basin-wide QAPP and reference applicable parts, they do need to have specific information addressed that is unique to a project such as: problem definition, task description, project objective, measurement performance specifications, sample design rationale, sampling methods requirements, data management, etc. There should be enough information provided in the QAPP appendix that it functions, for easy reference, like a stand-alone document. This information will be addressed during the project planning meeting.

QAPP appendices will be sent to the TCEQ CRP Project Manager, who will track the deliverables and forward them to the Lead QA Specialist for review. After the document has been reviewed by the TCEQ, comments will be compiled and sent to the Planning Agency through the TCEQ CRP Project Manager. The TCEQ is committed to an expeditious review and approval of these documents. Generally, they can be reviewed and approved within a short time frame if all issues discussed in the planning meeting are addressed properly.

Use and Qualification of Non-Measurement Data

Data which are not newly generated as part of a project are called “existing,” “historical,” or “non-measurement” data. For the purpose of routine data, Section B9 of the basin-wide QAPP shell document addresses non-measurement data and specifies, "this QAPP does not include the use of routine monitoring data obtained from non-measurement sources." Therefore, Planning Agencies should not request that historical routine data be submitted through the CRP.

However, in some cases, non-measurement data will be co-mingled with new data collected under a special project or permit support QAPP appendix. Acquiring non-measurement data can allow data needs to be met despite time and resource constraints. The use of non-measurement data may also provide more detailed and exhaustive information than the project could produce otherwise, allowing for a better understanding of the situation. Sources of non-measurement data include: other projects, databases, reports, etc. These non-measurement data must be qualified in Section B9 of the special study or permit support QAPP and will not be submitted to TCEQ for upload to SWQMIS.

To qualify non-measurement data, the Planning Agency must consider and describe the following Sections of data collection:

- Quality Objectives and Criteria - The original purpose of the data and what QAPP the data were collected under (if applicable) and measurement performance specifications.
- Sampling and Process Design - Sampling locations, dates and times; limitations associated with the data and how these may impact their intended use relative to the project objectives
- Sampling Methods, Handling and Custody - Chain-of-custody procedures, sample preservation, holding times.
- Analytical Methods- Type of analytical equipment, maintenance, and calibration procedures; laboratory analyst training and capability; sample preparation and methods of analysis.

For the purpose of CRP projects, it is important to verify that data are consistent with TCEQ requirements and; therefore, comparable to other data, allowing for comparisons. To qualify non-measurement data, the Planning Agency must use whatever metadata are available and consider and describe all Sections of the QAPP, as applicable in Section B9. The EPA Guidance document *EPA QA/G-5* provides information regarding the qualification and use of existing data.

QAPP Amendments

Project changes (including changes to analytical procedures/changes to Table A.7, NELAC Accreditation, sampling sites and/or schedule, changes that would affect the data generated by the project, project organization, etc.) require amendments to the QAPP. QAPP amendments are contract deliverables and will be submitted to the TCEQ on an "as needed" basis. The Planning Agency must provide a justification and summary of the changes as specified in the QAPP amendment shell, as well as specific details related to the required QAPP Sections. The changes should not be implemented until the amendment is fully executed. Note: A data correction request may be necessary to correct previously submitted data.



It is recognized that many QAPP amendments involve changes to address existing activities which have been consistent with program requirements all along and therefore correct information that was not included or was incorrect in the original QAPP. **These amendments should not be “backdated.”**

Note: If the changes made are funded by Federal programs, you may be required to create a stand-alone QAPP document. Please contact your CRP Project Manager about these changes.

Required signatures are designated on the QAPP shell document. Additional signatures can be added as needed (e.g., sub-participants).

To streamline the amendment process, there is a procedure for electronic review and approval of QAPP amendments. The steps for the process are as follows:

1. The Planning Agency sends the TCEQ CRP Project Manager an e-mailed amendment.
2. TCEQ CRP Project Manager, Project QA Specialist, and Lead CRP QA Specialist review the amendment and provide comments to the Planning Agency Project Manager or indicate that amendment can be approved.
3. If an amendment is ready to be approved, the TCEQ Lead CRP QA Specialist initiates an e-mail “signature page” and sends the e-mail to all signatories
4. Each signatory "replies to all" for the most recent email indicating approval, providing an email "trail" to show all approvals on a single email.

When the TCEQ Lead CRP QA Specialist receives the final signatures, s/he will put the TCEQ approval date on the cover of the final amendment and e-mail the completed signature page and amendment to the Planning Agency Project Manager or QAO, TCEQ Project Manager, and TCEQ DM&A.

As in the past, the Planning Agency will secure a commitment letter from affected sub-participants of its QAPP stating the sub-participants’ commitment to requirements contained in the QAPP amendment. An example letter is provided in the QAPP shell document. QAPP commitment documentation should be maintained as part of the project’s quality assurance records. **Copies of all commitment letters must be forwarded to the TCEQ no later than 60 days of TCEQ approval of the QAPP amendment but prior to the monitoring event.** (Note: Commitment letters are not required for entities who sign off on the QAPP)

QAPP Amendments must be distributed to all personnel on the distribution list maintained by the Planning Agency. (Note: The Lead CRP Quality Assurance Specialist) will distribute copies to TCEQ project participants, including but not limited to the TCEQ CRP Project Manager, DM&A staff, and the Houston Laboratory as appropriate).

Appendix B: Monitoring Schedule Update

Because the basin-wide QAPP has a two-year effective date, the monitoring schedule in Appendix B of the basin-wide QAPP will need to be updated for the second year of the biennium after the annual coordinated monitoring meeting. The update should include a summary of changes to the monitoring



schedule and revised maps. Updates to Appendix B should be sent electronically to the TCEQ CRP Project Manager on June 15, in the first year of the contract period. Review comments will be sent to the Planning Agency Project Manager within approximately 30 days of QAPP receipt. The Planning Agency must modify and resubmit the document within 30 days. The final revision is due by August 15, 2012.

Web Site Deliverable

Certain sections of QAPPs should be posted on the Planning Agency's CRP Web page to enable the public to know and understand the water quality monitoring that is being conducted in their basin. These sections include the monitoring program or project objectives, measurement performance specifications (i.e., Table A7), link to the coordinated monitoring schedule (CMS) website with disclaimer that states that the CMS includes stations monitored by other entities, and special study appendices. You may also include monitoring schedule and maps of sampling sites.

Quality Assurance Training

The CRP encourages all applicable Planning Agency personnel and in-kind contributors to obtain training on topics associated with those outlined in this task. This is especially critical to ensuring data are collected using TCEQ-approved policies and procedures. Special accommodations may need to be made to ensure in-kind contributors get an appropriate level and amount of training. All non-CRP training events require prior approval to be considered for reimbursement. All training will be itemized on the progress report and charged accordingly.



EXHIBIT 2A CORRECTIVE ACTION PROCESS FLOW CHART

Corrective Action Process for Deficiencies

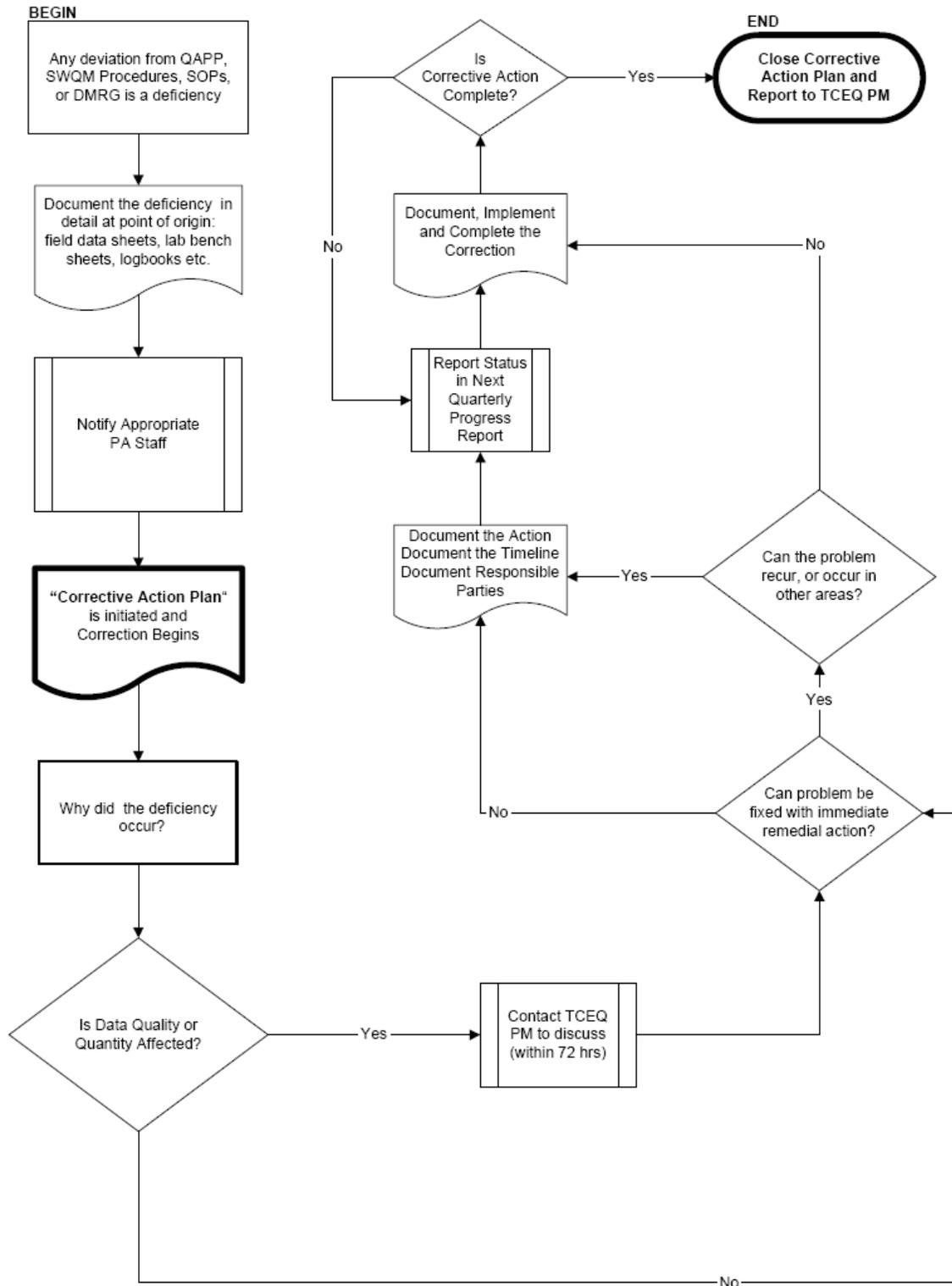




EXHIBIT 2B

CORRECTIVE ACTION STATUS TABLE



EXHIBIT 2C CORRECTIVE ACTION PLAN FORM



EXHIBIT 2C - Corrective Action Plan Form

Corrective Action Plan
Issued by: _____ Date Issued _____ Report No. _____
Description of deficiency
Root Cause of deficiency
Programmatic Impact of deficiency
Does the seriousness of the deficiency require immediate reporting to the TCEQ? If so, when was it?
Corrective Action to address the deficiency and prevent its recurrence
Proposed Completion Date for Each Action
Individual(s) Responsible for Each Action
Method of Verification
Date Corrective Action Plan Closed?