

***TEXAS COMMISSION ON ENVIRONMENTAL QUALITY'S CLEAN RIVERS  
PROGRAM NUTRIENT MONITORING QAPP  
FY12/13***

***UNDER EPA GRANT No. FY12-13 CWA 106  
QTRACK NO:***

***QUESTIONS CONCERNING THIS QAPP SHOULD BE DIRECTED TO:***

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***EFFECTIVE: IMMEDIATELY UPON APPROVAL BY ALL PARTIES***

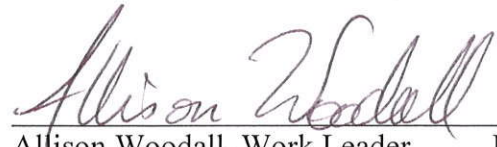
A1 APPROVAL PAGE

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Water Quality Planning Division*

  
\_\_\_\_\_  
Laurie Curra, Manager  
Water Quality Monitoring & Assessment Section


10/3/2011  
Date

  
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Allison Woodall, Work Leader  
Clean Rivers Program

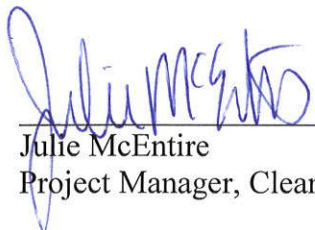
10/3/11  
Date

  
\_\_\_\_\_  
Jennifer Delk  
Project QA Specialist, Project Manager  
Clean Rivers Program

10/3/11  
Date

  
\_\_\_\_\_  
Patricia Wise  
Project Manager, Clean Rivers Program

10/3/11  
Date

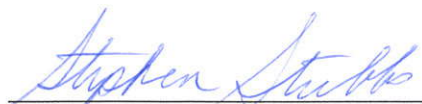
  
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Julie McEntire  
Project Manager, Clean Rivers Program

10/3/11  
Date

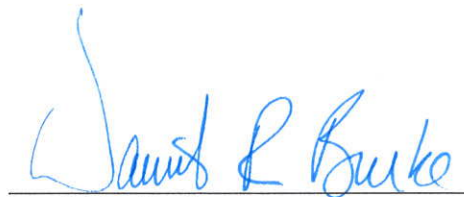
  
\_\_\_\_\_  
Jill Csekitz, Work Leader  
Water Quality Standards Group

10/3/11  
Date

*Field Operations Support Division*

  
\_\_\_\_\_  
Stephen Stubbs  
TCEQ Quality Assurance Manager

10-10-11  
Date

  
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Daniel R. Burke  
Lead CRP Quality Assurance Specialist  
Quality Assurance Section

10/10/2011  
Date

**BASIN PLANNING AGENCIES**

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Jenna Barrett, Project Manager      Date  
Brazos River Authority

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Debbie Magin, Project Manager      Date  
Guadalupe-Blanco River Authority

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Todd Running, Project Manager      Date  
Houston-Galveston Area Council

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*David Cowan*      *10-6-11*  
David Cowan, Project Manager      Date  
Lower Colorado River Authority

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David Hancock, Project Manager      Date  
Lower Neches River Authority

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Angela Kilpatrick, Project Manager      Date  
Trinity River Authority

BASIN PLANNING AGENCIES

 28SEP11  
\_\_\_\_\_  
Jenna Barrett, Project Manager      Date  
Brazos River Authority

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Debbie Magin, Project Manager      Date  
Guadalupe-Blanco River Authority

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Todd Running, Project Manager      Date  
Houston-Galveston Area Council

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David Cowan, Project Manager      Date  
Lower Colorado River Authority

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David Hancock, Project Manager      Date  
Lower Neches Valley Authority

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Angela Kilpatrick, Project Manager      Date  
Trinity River Authority

BASIN PLANNING AGENCIES

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Jenna Barrett, Project Manager      Date  
Brazos River Authority

*Debbie Magin*      9/27/11  
Debbie Magin, Project Manager      Date  
Guadalupe-Blanco River Authority

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Todd Running, Project Manager      Date  
Houston-Galveston Area Council

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David Cowan, Project Manager      Date  
Lower Colorado River Authority

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David Hancock, Project Manager      Date  
Lower Neches Valley Authority

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Angela Kilpatrick, Project Manager      Date  
Trinity River Authority

## BASIN PLANNING AGENCIES

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Jenna Barrett, Project Manager      Date  
Brazos River Authority

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Debbie Magin, Project Manager      Date  
Guadalupe-Blanco River Authority

      9/21/11

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Todd Running, Project Manager      Date  
Houston-Galveston Area Council

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David Cowan, Project Manager      Date  
Lower Colorado River Authority

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David Hancock, Project Manager      Date  
Lower Neches River Authority

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Angela Kilpatrick, Project Manager      Date  
Trinity River Authority

BASIN PLANNING AGENCIES

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Jenna Barrett, Project Manager      Date  
Brazos River Authority

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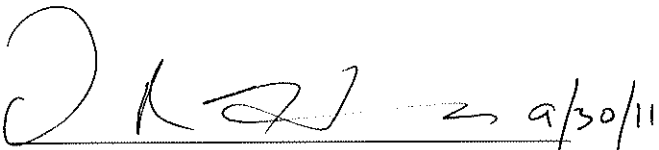
Debbie Magin, Project Manager      Date  
Guadalupe-Blanco River Authority

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Todd Running, Project Manager      Date  
Houston-Galveston Area Council

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David Cowan, Project Manager      Date  
Lower Colorado River Authority

 → 9/30/11

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David Hancock, Project Manager      Date  
Lower Neches Valley Authority

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Angela Kilpatrick, Project Manager      Date  
Trinity River Authority

BASIN PLANNING AGENCIES

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Jenna Barrett, Project Manager      Date  
Brazos River Authority

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Debbie Magin, Project Manager      Date  
Guadalupe-Blanco River Authority

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Todd Running, Project Manager      Date  
Houston-Galveston Area Council

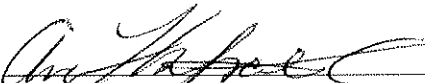
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David Cowan, Project Manager      Date  
Lower Colorado River Authority

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David Hancock, Project Manager      Date  
Lower Neches Valley Authority

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 9/29/11  
Angela Kilpatrick, Project Manager      Date  
Trinity River Authority



ENVIRONMENTAL PROTECTION AGENCY (EPA) – REGION VI

Curry Jones 10/24/11  
Curry Jones, Chief                      Date  
Assistance Programs Branch

Teresita S. Mendiola 10/24/11  
Teresita S. Mendiola                      Date  
106 Project Officer  
Assistance Programs Branch

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## LIST OF ACRONYMS

AWRL	Ambient Water Reporting Limit
BRA	Brazos River Authority
Chl-a	Chlorophyll-a
COC	Chain of Custody
CMS	Coordinated Monitoring Schedule
CRP	Clean Rivers Program
DMRG	Data Management Reference Guide
DM&A	Data Management and Analysis
EPA	United States Environmental Protection Agency
FY	Fiscal Year
GBRA	Guadalupe Blanco River Authority
HGAC	Houston Galveston Area Council
LNVA	Lower Neches Valley Authority
LOD	Limit of Detection
LOQ	Limit of Quantitation
NELAP	National Environmental Lab Accreditation Program
NH3	Ammonia
NO3	Nitrate Nitrogen
QA	Quality Assurance
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QAS	Quality Assurance Specialist
QC	Quality Control
QMP	Quality Management Plan
SOP	Standard Operating Procedure
SWQM	Surface Water Quality Monitoring
SWQMIS	Surface Water Quality Monitoring Information System
TCEQ	Texas Commission on Environmental Quality
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TP	Total Phosphorus
TNI	The NELAC Institute
TRA	Trinity River Authority
TSWQS	Texas Surface Water Quality Standards
WQS	Water Quality Standards

## **A3 DISTRIBUTION LIST**

**U.S Environmental Protection Agency Region 6**  
**1445 Ross Avenue, Suite 1200**  
**Mail Code 6-WQ**  
**Dallas, Texas 75202-2733**

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**Texas Commission on Environmental Quality**  
**P.O. Box 13087**  
**Austin, Texas 78711-3087**

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TRA - Jennifer Delk (512) 239-4712  
HGAC & LCRA - Patricia Wise (512) 239-2240  
LNVA - Julie McEntire (512) 239-6693

Daniel R. Burke  
Lead CRP Quality Assurance Specialist  
MC-176  
(512) 239-0011

Jill Csekitz  
Work Leader, Water Quality Standards MC-234  
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Nancy Ragland  
Team Leader, Data Management and Analysis  
MC-234  
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## **Basin Planning Agencies**

Brazos River Authority (BRA)  
4600 Cobbs Drive  
Waco, Texas 76710  
Jenna Barrett, Project Manager  
(254) 761-3149

Guadalupe-Blanco River Authority (GBRA)  
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Debbie Magin, Project Manager  
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Houston-Galveston Area Council (HGAC)  
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Houston, Texas 77027  
Todd Running, Project Manager  
(713) 993-4549

Lower Colorado River Authority (LCRA)  
P.O. Box 220  
Austin, Texas 78767-0220  
David Cowan, Project Manager  
(512) 473-3200 Extension 2495

Lower Neches Valley Authority (LNVA)  
6790 Bigner Road  
Beaumont, TX 77708  
David Hancock, Project Manager  
(409) 898-0561

Trinity River Authority (TRA)  
5300 South Collins  
Arlington, Texas 76018  
P.O. Box 60  
Arlington, Texas 76004  
Angela Kilpatrick, Project Manager  
817-493-5179

The Basin Planning Agency will provide copies of this project plan and any amendments or appendices of this plan to each person on this list and to each sub-tier project participant, e.g., subcontractors, other units of government. The Basin Planning Agency will document distribution of the plan and any amendments and appendices, maintain this documentation as part of the project's quality assurance records, and will ensure the documentation is available for review.

## **A4 PROJECT/TASK ORGANIZATION**

### ***Description of Responsibilities***

#### ***TCEQ***

##### **Laurie Curra**

##### **Manager, Monitoring and Assessment Section**

Responsible for oversight of the implementation of the Quality Assurance Project Plans (QAPPs), directs the day-to-day management of the section.

##### **Jill Csekitz**

##### **Work Leader, Water Quality Standards**

Responsible for managing the TCEQ's Water Quality Standards Program's work activities, commitments, deliverables, and time frame. Develops necessary lines of communication and good working relationships between the WQS Program and personnel of other divisions and organizations. Participates in development of project and quality documents and provides input on issues related to WQS development. Provides input on measurement quality objectives associated with Water Quality Standards user requirements. Determines acceptability of measurement data collected by the WQS Program.

##### **Allison Woodall**

##### **CRP Work Leader**

Responsible for TCEQ activities supporting the development and implementation of the Texas Clean Rivers Program. Responsible for verifying that the QMP is followed by CRP staff. Supervises TCEQ CRP staff. Reviews and responds to any deficiencies, corrective actions, or findings related to the area of responsibility. Oversees the development of QA guidance for the CRP. Reviews and approves all QA audits, corrective actions, reviews, reports, work plans, contracts, QAPPs, and TCEQ QMP. Enforces corrective action, as required, where QA protocols are not met. Ensures CRP personnel are fully trained.

##### **Daniel R. Burke**

##### **CRP Lead Quality Assurance Specialist**

Participates in the development, approval, implementation, and maintenance of written quality assurance standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Assists program and project manager in developing and implementing quality system. Serves on planning team for CRP special projects. Coordinates the review and approval of CRP QAPPs. Prepares and distributes annual audit plans. Conducts monitoring systems audits of Planning Agencies. Concurs with and monitors implementation of corrective actions. Conveys QA problems to appropriate management. Recommends that work be stopped in order to safeguard programmatic objectives, worker safety, public health, or environmental protection. Ensures maintenance of QAPPs and audit records for the CRP.

## **CRP Project Managers**

Allison Woodall - BRA & GBRA

Jennifer Delk - TRA

Patricia Wise – HGAC & LCRA

Julie McEntire - LNVA

Responsible for the development, implementation, and maintenance of CRP contracts. Tracks, reviews, and approves deliverables. Participates in the development, approval, implementation, and maintenance of written quality assurance standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Assists CRP Lead QA Specialist in conducting Basin Planning Agency audits. Verifies QAPPs are being followed by contractors and that projects are producing data of known quality. Coordinates project planning with the Basin Planning Agency Project Manager. Reviews and approves data and reports produced by contractors. Notifies QA Specialists of circumstances which may adversely affect the quality of data derived from the collection and analysis of samples. Develops, enforces, and monitors corrective action measures to ensure contractors meet deadlines and scheduled commitments.

## **Nancy Ragland**

### **Team Leader, Data Management and Analysis Team**

Participates in the development, approval, implementation, and maintenance of written quality assurance standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Ensures DM&A staff perform data management related tasks, including coordination and tracking of CRP data sets from initial submittal through CRP Project Manager review and approval; ensuring that data is reported following instructions in the *Surface Water Quality Monitoring Data Management Reference Guide* (January 2010, or most current version); running automated data validation checks in SWQMIS and coordinating data verification and error correction with CRP Project Managers; generating SWQMIS summary reports to assist CRP Project Managers' data review; identifying data anomalies and inconsistencies; providing training and guidance to CRP and Planning Agencies on technical data issues to ensure that data are submitted according to documented procedures; reviewing QAPPS for valid stream monitoring stations, validity of parameter codes, submitting entity code(s), collecting entity code(s), and monitoring type code(s); developing and maintaining data management-related standard operating procedures for CRP data management; and coordinating and processing data correction requests.

## **Jennifer Delk**

### **CRP Project Quality Assurance Specialist**

Serves as liaison between CRP management and TCEQ QA management. Participates in the development, approval, implementation, and maintenance of written quality assurance standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Serves on planning team for CRP special projects and reviews QAPPs in coordination with other CRP staff. Coordinates documentation and implementation of corrective action for the CRP.

## ***BASIN PLANNING AGENCIES***

### **Project Managers**

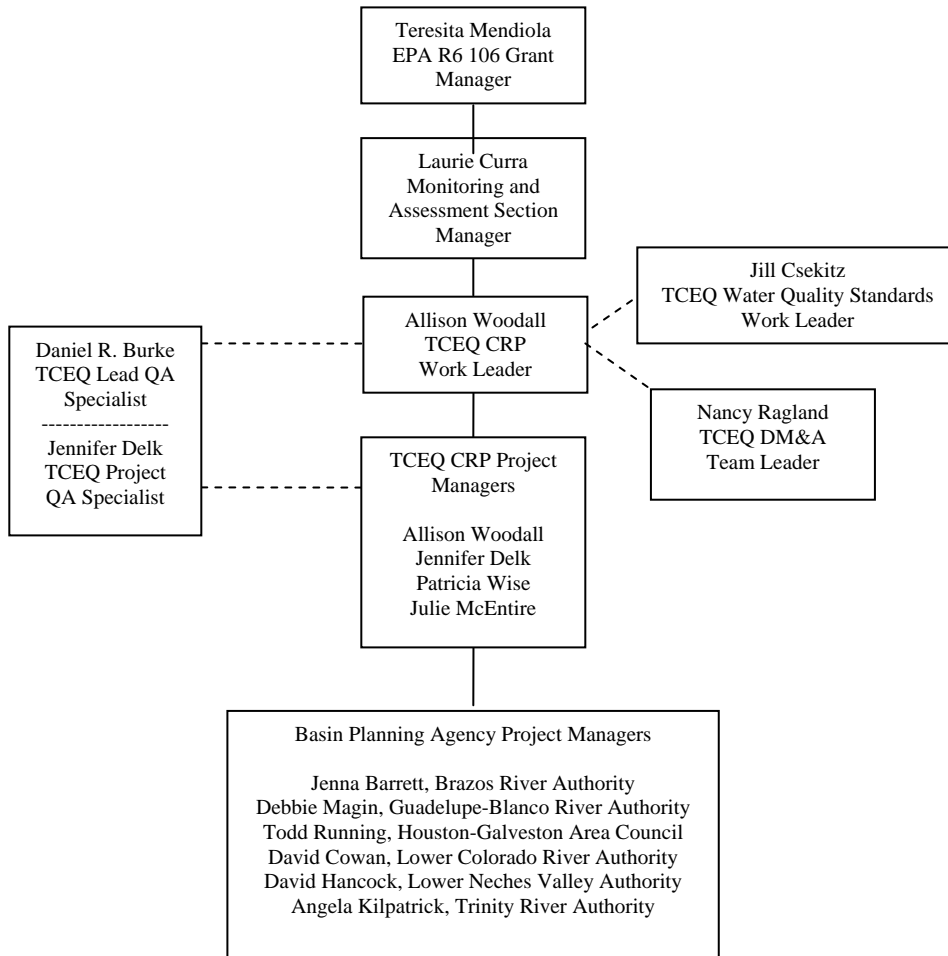
Jenna Barrett, Brazos River Authority  
Debbie Magin, Guadalupe-Blanco River Authority  
Todd Running, Houston-Galveston Area Council  
David Cowan, Lower Colorado River Authority  
David Hancock, Lower Neches Valley Authority  
Angela Kilpatrick, Trinity River Authority

Responsible for implementing and monitoring CRP requirements in contracts, QAPPs, and QAPP amendments and appendices. Coordinates basin planning activities and work of basin partners. Ensures monitoring systems audits are conducted to ensure QAPPs are followed by basin planning agency participants and that projects are producing data of known quality. Ensures that subcontractors are qualified to perform contracted work. Ensures CRP project managers and/or QA Specialists are notified of deficiencies and corrective actions, and that issues are resolved. Responsible for validating that data collected are acceptable for reporting to the TCEQ.



# PROJECT ORGANIZATION CHART

Figure A4.1. Organization Chart - Lines of Communication



Lines of Management ———  
Lines of Communication - - - - -

## A5 PROBLEM DEFINITION

Since 1998, EPA has mandated that states incorporate numerical criteria for nutrients in their water quality standards. Initially, the deadline for adopting nutrient criteria was 2004. However, EPA has substantially extended these time frames, in accordance with “Nutrient Development Plans” that are submitted by each state and reviewed by EPA.

Recently, EPA has been encouraging states to accelerate their efforts and give priority to adopting numeric nutrient standards or numeric translators for narrative standards for all waters in states that contribute nutrient loadings to waterways. Nutrients of interest are total phosphorus (TP) and total nitrogen (TN). Recent EPA guidance indicates that states can independently develop TP and TN criteria by evaluating the relationship of TP and TN with response variables such as fish and invertebrate indices of biotic integrity, dissolved oxygen dynamics, planktonic chlorophyll *a* (Chl *a*) in reservoirs and estuaries, and algal coverage in streams.

For development of nutrient criteria and related assessments, Texas Commission on Environmental Quality (TCEQ) staff has identified additional needs for nutrient data in reservoirs, streams, rivers, and estuaries. TCEQ staff suggestions, where feasible, are to (1) collect TP and TN as a part of routine monitoring; (2) run TP and TN samples at lower quantification levels, especially where nutrient concentrations are not elevated; and (3) routinely collect key nutrient parameters (TP, TN, nitrate, nitrite, TKN, Chl *a*, Secchi; and salinity for estuaries), especially on water bodies without adequate datasets of these parameters (~30 datapoints).

The data needs that were suggested above are expected to be important to future development and assessment of nutrient criteria in several ways. For reservoir criteria; (1) additional data is needed to quantify Chl *a* and TP in reservoirs of low/moderate productivity; (2) the number of reservoirs with criteria needs to be expanded; (3) the potential for incorporating nutrient standards that utilize multiple parameters needs to be further considered, and (4) reduce the amount of data reported as “less than” values. The needs for criteria development in streams and rivers are similar, except that estimates and measurements of algal coverage become more important than Chl *a* in water for smaller rivers and streams. The needs for criteria in estuaries are also similar to those for reservoirs, with an additional emphasis on the evaluation of salinity variability. For rivers and streams, and to some extent for estuaries, TCEQ anticipates evaluating a wider range of variables, such as dissolved oxygen dynamics and biological indices, in order to help define responses to TP and TN. For all criteria development, relatively high percentages of “less than” data for TP, TN, and Chl *a* can increase uncertainties and statistical difficulties in typical calculations

## A6 PROJECT/TASK DESCRIPTION

Six Basin Planning Agencies who contract with TCEQ under the Texas Clean Rivers Program (CRP) will conduct monitoring at routine monitoring sites for nutrient species and related water quality constituents, at a frequency needed to obtain sufficient data to support the future development of nutrient criteria and related assessments. This project supplements the collection of the following nutrient parameters: total phosphorus, total kjeldahl nitrogen, nitrate, and nitrite (and/or nitrate plus nitrite), and other supporting field parameters not currently collected under the CRP partner’s monitoring plan. The details on number of analyses and parameters analyzed are in Attachment A.

The work will occur during fiscal years 2012 and 2013 and the data will be reported to TCEQ semi-annually for review and submittal to SWQMIS.

The purpose of this QAPP is to provide the project organization, data management, and data acquisition information for the collection of for additional nutrient data and/or analyses at the lower detection levels. This QAPP will also document deviations from the basin-wide QAPPs. Each Basin Planning Agency participating under this QAPP will collect data under ongoing 2-year individual QAPPs required by the CRP. These QAPPs contain details related to each Basin Planning Agency's QA policy, management structure, and procedures which will be used to implement the QA requirements necessary to verify and validate the surface water quality data collected are located in those Clean Rivers Program QAPPs and referenced in this document. TCEQ considers the field and laboratory quality assurance and quality control procedures and measures outlined in each CRP QAPP referenced in this document to be consistent with, and in some cases, more stringent than TCEQ's Surface Water Quality Monitoring Program and Water Quality Assessment Program QAPP.

The Clean Rivers Program QAPPs are reviewed and approved by the TCEQ to help ensure that data generated for the purposes described above are scientifically valid and legally defensible. This process will ensure that data collected under this QAPP and submitted to SWQMIS has been collected and managed in a way that ensures that it is acceptable for use by TCEQ in developing water quality standards, as well as guarantees its reliability and therefore can be used in water quality assessments and other programs deemed appropriate by the TCEQ.

### **Amendments to the QAPP**

Amendments to the QAPP may be necessary to reflect changes in project organization, tasks, schedules, objectives, and methods; address deficiencies and nonconformances; improve operational efficiency; and/or accommodate unique or unanticipated circumstances. Requests for amendments are directed from the Basin Planning Agency Project Manager to the TCEQ Project Manager in writing using the QAPP Amendment shell. The changes are effective immediately upon approval by the TCEQ CRP Project Manager and Quality Assurance Specialist, or their designees, and the EPA Project Officer (if necessary).

Amendments to the QAPP and the reasons for the changes will be documented, and full copies of amendments will be forwarded to all persons on the QAPP distribution list by the CRP QAO. Amendments shall be reviewed, approved, and incorporated into a revised QAPP during the annual revision process or within 120 days of the initial approval in cases of significant changes.

### **Amendments to the CRP Basin-wide QAPPs**

Revisions to the Basin-wide QAPPs may be necessary to address incorrectly documented information or to reflect changes in project organization, tasks, schedules, objectives, and methods. Requests for amendments will be directed from the Basin Planning Agency Project Manager to the CRP Project Manager electronically. Amendments are effective immediately upon approval by the Basin Planning Agency Project Manager, the Basin Planning Agency QAO, the CRP Project Manager, the CRP Lead QA Specialist, the CRP Project QA Specialist, and additional parties affected by the amendment. Amendments are not retroactive. They will be incorporated into the QAPP by way of attachment and distributed to personnel on the distribution list by the Basin Planning Agency Project Manager.

**Amendments affecting the sections referenced in this document will be made available to those on the distribution list electronically.**

Note: The Basin Planning Agency will secure written documentation from each sub-tier project participant (e.g., subcontractors, other units of government) stating the organization’s awareness of and commitment to requirements contained in each amendment to the QAPP. The Basin Planning Agency will maintain this documentation as part of the project’s quality assurance records, and ensure that the documentation is available for review.

## Revisions to the QAPP

Until the work described is completed, this QAPP shall be revised as necessary and reissued annually on the anniversary date, or revised and reissued within 120 days of significant changes, whichever is sooner. The most recently approved QAPPs shall remain in effect until revisions have been fully approved; reissuances (i.e., annual updates) must be submitted to the TCEQ for approval before 60 days the last version has expired. If the entire QAPP is current, valid, and accurately reflects the project goals and organization’s policy, the annual reissuance may be done by a certification that the plan is current. This can be accomplished by submitting a cover letter stating the status of the QAPP and a copy of new, signed approval pages for the QAPP.

## A7 QUALITY OBJECTIVES AND CRITERIA

The purpose of routine water quality monitoring is to collect surface water quality data that can be used to characterize water quality conditions, identify significant long-term water quality trends, support water quality standards development, support the permitting process, and conduct water quality assessments in accordance with *TCEQs Guidance for Assessing Texas Surface and Finished Drinking Water Quality Data*. These water quality data will be subsequently reconciled and used by the TCEQ.

The measurement performance specifications to support the project objectives are specified in Table A7.1. The collection of the following parameters will be under a TCEQ-approved QAPP. Details on the methods used, LOQs, precision, bias, laboratory and additional QA are located in Appendix A of each participating CRP partner’s basin-wide QAPPs.

*Table A7.1 - Measurement Performance Specifications*

Parameter	Units	Matrix	Parameter Code(s)	AWRL	Project RL
<b>Conventional Parameters (Water)</b>					
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	00610	0.1	0.1
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	00625	0.2	0.2
Nitrate plus Nitrite, Total 1 Det. (mg/L as N)	mg/L	water	00630	0.05	0.04
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	00620	0.05	0.02
NITRITE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	00615	0.05	0.02
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	00665	0.06	0.02
CHLOROPHYLL-A, UG/L	ug/L	water	32211 70953	3	3

Parameter	Units	Matrix	Parameter Code(s)	AWRL
<b>Diel Measurements (Water)</b>				
TEMPERATURE, WATER (DEGREES CENTGRADE), 24HR AVG	DEG C	Water	00209	NA
WATER TEMPERATURE, DEGREES CENTIGRADE, 24HR MAX	DEG C	Water	00210	NA
TEMPERATURE, WATER (DEGREES CENTIGRADE) 24HR MIN	DEG C	Water	00211	NA
SPECIFIC CONDUCTANCE, uS/CM, FIELD, 24HR AVG	uS/cm	Water	00212	NA
SPECIFIC CONDUCTANCE, uS/CM, FIELD, 24HR MAX	uS/cm	Water	00213	NA
SPECIFIC CONDUCTANCE, uS/CM, FIELD, 24HR MIN	uS/cm	Water	00214	NA
PH, S.U., 24HR MAXIMUM VALUE	std. units	Water	00215	NA
PH, S.U., 24HR, MINIMUM VALUE	std. units	Water	00216	NA
WATER TEMPERATURE, # OF MEASUREMENTS IN 24-HRS	NU	Water	00221	NA
SPECIFIC CONDUCTANCE, # OF MEASUREMENTS IN 24-HR	NU	Water	00222	NA
pH, # OF MEASUREMENTS IN 24-HRS	NU	Water	00223	NA
DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA	mg/l	Water	89855	NA
DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA	mg/l	Water	89856	NA
DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA	mg/l	Water	89857	NA
DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24-HRS	NU	Water	89858	NA

References:

TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, 2008 (RG-415).

## Reporting Limits (RLs)

Initial investigation of available data in the Surface Water Quality Monitoring Information System (SWQMIS) by TCEQ staff demonstrated that a large percentage of data is reported at or below the ambient water reporting limits (AWRLs). Data that is reported as “less than” values is difficult to statistically analyze in the way needed to develop water quality standards and accurately characterize water quality conditions. In addition, laboratories are not currently analyzing total nitrogen. For the purpose of determining nutrient criteria, The TCEQ will have to derive total nitrogen results by calculating the sum of other nutrient parameters (i.e., total kjeldahl nitrogen (TKN), nitrate, and nitrite).

To further the available data for future development of numeric nutrient criteria for the state, the TCEQ has developed this project with partners to fill in data gaps identified by staff and lower the reported limits for nutrient constituents to decrease the number of censored data. Lower project reporting limits have been developed based on literature research and laboratory capabilities with a goal of reporting TP at 0.02mg/L and TN at 0.24mg/L.

The following requirements must be met in order to report results for this project:

- The laboratory's LOQ for each analyte must be at or below the Ambient Water Reporting Limit as a matter of routine practice
- If practicable, the LOQ for each analyte must be at or below the Project Specific Reporting Limit 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 project samples analyzed.

Laboratory Measurement Quality Control Requirements and Acceptability Criteria are provided in Section B5 of each participating CRP partner's basin-wide QAPP

### **Precision**

As described in Section A7 of each participating CRP partner's basin-wide QAPP.

### **Bias**

As described in Section A7 of each participating CRP partner's basin-wide QAPP.

### **Representativeness**

The sites sampled for the purposes of this project will be established monitoring sites with existing datasets. This data collection effort will add to the existing water quality data collected and ensure that the nutrient variables are collected at the project reporting limit or lower. Preference will be given to sampling sites in this order:

1. main pool sites (dam sites) on reservoirs,
2. historical long term sampling stations on classified segments,
3. and historical sampling sites on unclassified segments.

As described in Section A7 of each participating CRP partner's basin-wide QAPP.

### **Comparability**

As described in Section A7 of each participating CRP partner's basin-wide QAPP.

**Completeness**

As described in Section A7 of each participating CRP partner's basin-wide QAPP.

**A8 SPECIAL TRAINING/CERTIFICATION**

As described in Section A7 of each participating CRP partner's basin-wide QAPP.

**A9 DOCUMENTS AND RECORDS**

As described in Section A9 of each participating CRP partner's basin-wide QAPP.

## **B1 SAMPLING PROCESS DESIGN**

### *Geographic Coverage*

Total phosphorus and the components of total nitrogen should be run at representative sites on both classified and unclassified water bodies. Sites should include those that have been historically monitored on a routine basis. If only limited coverage can be obtained due to limited resources, then the priority should be representative sites on classified segments. For reservoirs, a site near the dam in the main pool of the reservoir should be sampled. For estuaries, a site in the main body that has been routinely monitored historically should be sampled. If a site was previously dropped where routine monitoring historically occurred, the station should be reinstated as a routine monitoring station.

### *Frequency*

Sites should be sampled at least quarterly.

Sampling stations and frequencies are described in Section B1 of each participating CRP partner's basin-wide QAPP and posted on the Coordinated Monitoring Schedule (CMS). The CMS is available on the LCRA's Web page at <http://cms.lcra.org/>

### **Sample Design Rationale and Site Selection Criteria**

As described in Section B1 of each participating CRP partner's basin-wide QAPP.

## **B2 SAMPLING METHODS**

As described in Section B2 of each participating CRP partner's basin-wide QAPP.

### **Field Sampling Procedures.**

As described in Section B2 of each participating CRP partner's basin-wide QAPP.

### *Sample volume, container types, minimum sample volume, preservation requirements, and holding time requirements.*

As described in Section B2 of each participating CRP partner's basin-wide QAPP.

### **Sample Containers**

As described in Section B2 of each participating CRP partner's basin-wide QAPP.

### **Processes to Prevent Contamination**

As described in Section B2 of each participating CRP partner's basin-wide QAPP.

### **Documentation of Field Sampling Activities**



As described in Section B2 of each participating CRP partner's basin-wide QAPP.

### **Recording Data**

As described in Section B2 of each participating CRP partner's basin-wide QAPP.

### **Sampling Method Requirements or Sampling Process Design Deficiencies, and Corrective Action**

As described in Section B2 of each participating CRP partner's basin-wide QAPP.

## **B3 SAMPLING HANDLING AND CUSTODY**

As described in Section B3 of each participating CRP partner's basin-wide QAPP.

### **Chain-of -Custody**

As described in Section B3 of each participating CRP partner's basin-wide QAPP.

### **Sample Labeling**

As described in Section B3 of each participating CRP partner's basin-wide QAPP.

### **Sample Handling**

As described in Section B3 of each participating CRP partner's basin-wide QAPP.

### **Sample Tracking Procedure Deficiencies and Corrective Action**

As described in Section B3 of each participating CRP partner's basin-wide QAPP.

## **B4 ANALYTICAL METHODS**

The analytical methods, associated matrices, and performing laboratories are listed in Appendix A of each participating CRP partner's basin-wide QAPP. The authority for analysis methodologies under the Clean Rivers Program is derived from the TSWQS (§§307.1 - 307.10) in that data generally are generated for comparison to those standards and/or criteria. The Standards state that "*Procedures for laboratory analysis must be in accordance with the most recently published edition of the book entitled Standard Methods for the Examination of Water and Wastewater, the TCEQ Surface Water Quality Monitoring Procedures as amended, 40 CFR 136, or other reliable procedures acceptable to the commission, and in accordance with chapter 25 of this title.*"

Laboratories analyzing data under this QAPP are compliant with the TNI Standards. Copies of laboratory QMs and SOPs are available for review by the TCEQ.

### **Standards Traceability**

As described in Section B4 of each participating CRP partner's basin-wide QAPP.

#### **Analytical Method Deficiencies and Corrective Action**

As described in Section B4 of each participating CRP partner's basin-wide QAPP.

### **B5 QUALITY CONTROL**

#### **Sampling Quality Control Requirements and Acceptability Criteria**

As described in Section B5 of each participating CRP partner's basin-wide QAPP.

#### **Laboratory Measurement Quality Control Requirements and Acceptability Criteria**

As described in Section B5 of each participating CRP partner's basin-wide QAPP.

#### **Quality Control or Acceptability Requirements Deficiencies and Corrective Actions**

As described in Section B5 of each participating CRP partner's basin-wide QAPP.

### **B6 INSTRUMENT/EQUIPMENT TESTING, INSPECTION AND MAINTENANCE**

As described in Section B6 of each participating CRP partner's basin-wide QAPP.

### **B7 INSTRUMENT CALIBRATION AND FREQUENCY**

As described in Section B7 of each participating CRP partner's basin-wide QAPP.

### **B8 INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES**

As described in Section B8 of each participating CRP partner's basin-wide QAPP.

## **B9 NON-DIRECT MEASUREMENTS**

This project supplements the collection of the following nutrient parameters: total phosphorus, total kjeldahl nitrogen, nitrate, and nitrite (and/or nitrate plus nitrite), and other supporting field parameters not currently collected under the CRP partner's monitoring plan. The details on number of analyses and parameters analyzed under this project are in Attachment A. The data for this project along with the routine data submitted under the Basin-wide QAPP will be reported to the agency semi-annually for review and submittal to SWQMIS. The combined data will be sufficient to support the future development of nutrient criteria and related assessments.

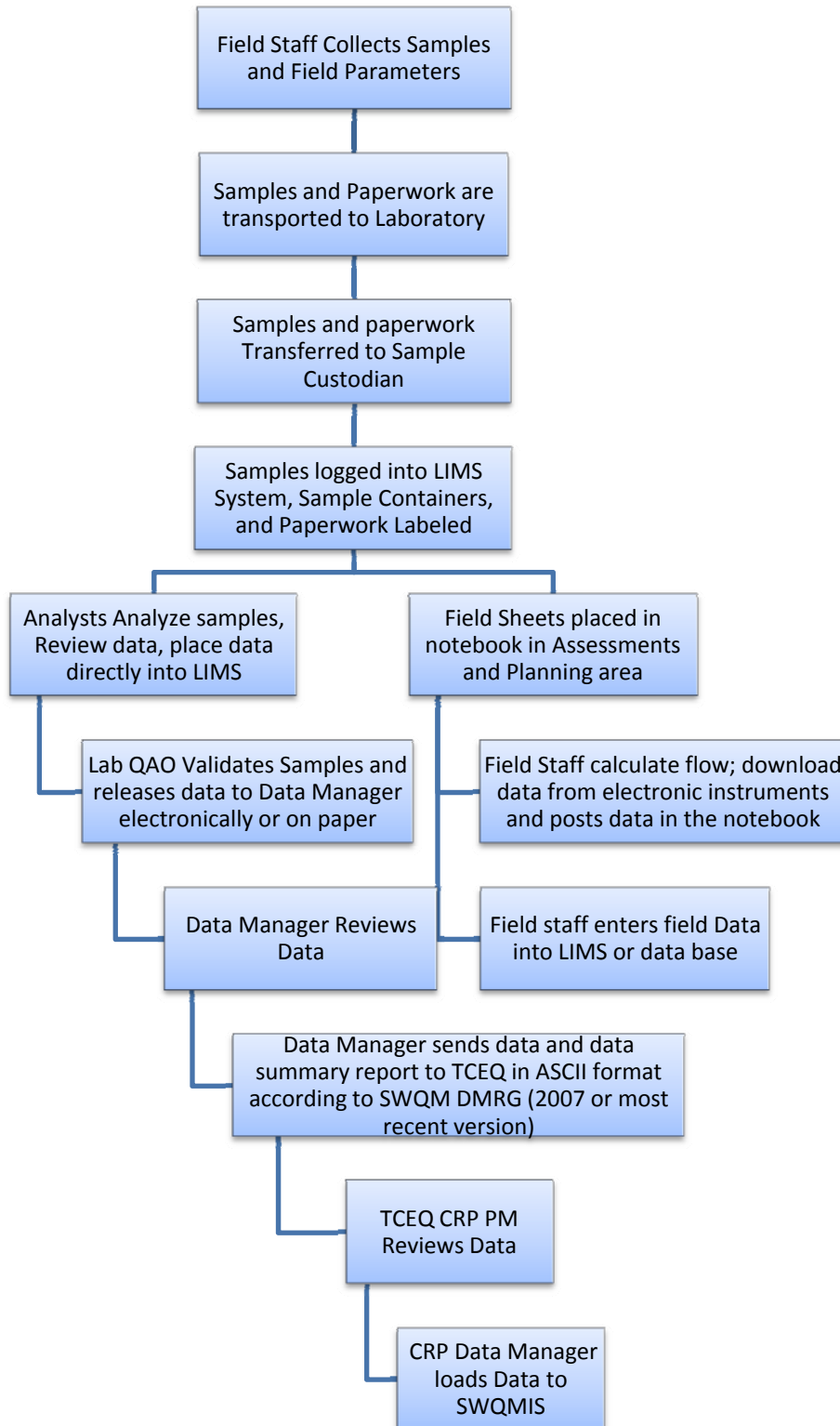
Field sampling is to be conducted according to procedures documented in the *TCEQ Surface Water Quality Monitoring Procedures Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue, 2008.(RG-415)* and *Volume 2: Methods for Collecting and Analyzing Biological Community and Habitat Data (RG-416)*.

Procedures for laboratory analysis are in accordance with the most recently published edition of Standard Methods for the Examination of Water and Wastewater, 40 CFR 136, or otherwise approved or otherwise approved independently to determine comparability with data generated by the SWQM Program.

## B10 DATA MANAGEMENT

In general data from Planning Agencies moves along the following path.

*Figure B10.1. Data Path*



Details on data paths are described in Section B10 of each participating CRP partner's basin-wide QAPP.

## **C1 ASSESSMENTS AND RESPONSE ACTIONS**

As described in Section C1 of each participating CRP partner's basin-wide QAPP.

### **Corrective Action**

As described in Section C1 of each participating CRP partner's basin-wide QAPP.

## **C2 REPORTS TO MANAGEMENT**

### **Reports to Planning Agency Project Management**

As described in Section C2 of each participating CRP partner's basin-wide QAPP.

### **Reports to TCEQ Project Management**

As described in Section C2 of each participating CRP partner's basin-wide QAPP.

### **Reports by TCEQ Project Management**

As described in Section C2 of each participating CRP partner's basin-wide QAPP.

## **D1 DATA REVIEW, VERIFICATION, AND VALIDATION**

As described in Section D1 of each participating CRP partner's basin-wide QAPP.

## **D2 VERIFICATION AND VALIDATION**

As described in Section D2 of each participating CRP partner's basin-wide QAPP.

## **D3 RECONCILIATION WITH USER REQUIREMENTS**

Data produced in this project, and data collected by other organizations (e.g., USGS, TCEQ, etc.), will be analyzed and reconciled with project data quality requirements. Data meeting project requirements will be used by the TCEQ for water quality standards development, the *Texas Water Quality Integrated Report* in accordance with *TCEQ's Guidance for Assessing Texas Surface and Finished Drinking Water Quality Data*, and for TMDL development, and permit decisions as appropriate. Data which do not meet requirements will not be submitted to SWQMIS nor will be considered appropriate for any of the uses noted above.

***ATTACHMENT A***

***NUMBER OF ANALYSES AND PARAMETERS ANALYZED BY CONTRACTOR***

### ***Number of Analyses and parameters analyzed by contractor under the 106 Grant***

The number of analyses and parameters analyzed under this project have been broken down annually by contractor.

#### **Brazos River Authority**

<b>Parameter</b>	<b>Analyses</b>	<b>Frequency</b>	<b>No. months</b>	<b>Total no. samples</b>
TP	11	monthly	12	132
TP	7	quarterly	4	28
TKN	11	monthly	12	132
TKN	7	quarterly	4	28
NH3	11	monthly	12	132
NH3	7	quarterly	4	28
NO3	11	monthly	12	132
NO3	7	quarterly	4	28
Chl-a	11	monthly	12	132
Chl-a	7	quarterly	4	28

#### **Guadalupe-Blanco River Authority**

<b>Parameter</b>	<b>Analyses</b>	<b>Frequency</b>	<b>No. months</b>	<b>Total no. samples</b>
TKN	19	bimonthly	6	114
TKN	10	quarterly	4	40

#### **Houston-Galveston Area Council**

<b>Parameter</b>	<b>Analyses</b>	<b>Frequency</b>	<b>No. months</b>	<b>Total no. samples</b>
NO2/NO3, NH3,TP, TKN	88	quarterly	4	352
Chl-a	9	quarterly	4	36
Chl-a	45	quarterly	4	180
TKN	206	quarterly	4	824
Diel (24hour)	6	bimonthly	6	36

### Lower Colorado River Authority

Parameter	Analyses	Frequency	No. months	Total no. samples
TKN	45	quarterly	4	180
TKN	68	bimonthly	6	408
Chl-a	45	quarterly	4	180
Chl-a	68	bimonthly	6	408
TP	45	quarterly	4	180
TP	68	bimonthly	6	408

### Lower Neches Valley Authority

Parameter	Analyses	Frequency	No. months	Total no. samples
TKN	19	quarterly	4	76
Chl-a	19	quarterly	4	76

### Trinity River Authority

Parameter	Analyses	Frequency	No. months	Total no. samples
Chl-a	14	monthly	7	98
TP	14	monthly	12	168
NH3	14	monthly	12	168
NO3	14	monthly	12	168
TKN	14	monthly	12	168