Nueces River Authority FY 2026–2027 Clean Rivers Program Quality Assurance Project Plan

500 IH 69, Suite 805
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Clean Rivers Program
Water Quality Planning Division
Texas Commission on Environmental Quality
P.O. Box 13087, MC 234
Austin, Texas 78711-3087
Effective Period: FY 2026 to FY 2027

Questions concerning this QAPP should be directed to:

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A2 Approval Page

Texas Commission on Environmental Quality

Water Quality Planning Division

10/2/2025

Jason Godeaux, Manager Date
Water Quality Monitoring and Assessment Section

9/25/2025

Sarah Whitley, Team Leader Date
Water Quality Standards and Clean Rivers Program

9/25/2025

Sunshyne Hendrix Date
Project Quality Assurance Specialist
Clean Rivers Program

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Kiran Freeman, Project Manager Date
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Cathy Anderson, Team Leader Date
Data Management and Analysis

Air Monitoring Division

10/03/2025

D. Jody Koehler, Date
TCEQ Quality Assurance Manager
Laboratory and Quality Assurance Section

10/02/2025

Loren Walker, Date
Lead CRP Quality Assurance Specialist
Quality Assurance Team

Nueces River Authority

Lorie Flores 9/22/25
Lorie Flores, Director of Resource Protection and Water Quality — Date

J. Wright 9/22/25
Jessica Wright, Project Manager — Date

Courtney Taylor 9/22/25
Courtney Taylor, Quality Assurance Officer and Field Supervisor — Date

9/22/25
Wesley Harris, Data Specialist — Date

City of Corpus Christi Water Utilities Laboratory (WUL)

9/23/2025
Michael McCall — Date
WUL Lab Manager

09/23/2025
LaDona Parr — Date
WUL Lab Quality Assurance Officer

Texas A&M University – Corpus Christi (TAMU-CC)

Department of Physical and Environmental Sciences (PENS)

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Hao Yu — Date
PENS Lab Research Associate

Richard Coffin — Digitally signed by Richard Coffin Date: 2025.09.23 09:13:09 -05'00'
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PENS Lab Quality Assurance Officer

San Antonio River Authority Regional Environment Laboratory (SARA REL)

Zachary Jendrusch 9/24/2025
Zachary Jendrusch Date
SARA REL Lab Supervisor

Jeanette Hernandez 9/24/2025
Jeanette Hernandez Date
SARA REL Lab Quality Assurance Officer

Lower Colorado River Authority Environmental Laboratory Services (LCRA-ELS)

Dale Jurecka 9/23/25
Dale Jurecka Date
LCRA-ELS Lab Manager

09/23/2025
Angel Mata Date
LCRA-ELS Lab Quality Assurance Officer

Energy Laboratories, Inc. (Energy Lab)

Cindy Rohrer Laboratory Manager
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Cindy Rohrer Date
Lab Manager

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Lab Quality Assurance Officer

Bandera County River Authority and Groundwater District (BCRAGD)

9/25/2025
David Mauk Date
BCRADG General Manager

9/25/25
Clint Carter Date
BCRAGD Watershed Protection Coordinator/
Field Supervisor and Quality Assurance Officer

9/25/2025
Shelby Sckittone Date
Natural Resource Specialist

A3 Table of Contents

List of Acronyms

AWRL	Ambient Water Reporting Limit
BA	Bandera County River Authority and Groundwater District
BCRAGD	Bandera County River Authority and Groundwater District
BMP	Best Management Practices
CAP	Corrective Action Plan
CE	Collecting Entity
CFR	Code of Federal Regulations
COC	Chain of Custody
CRP	Clean Rivers Program
DMRG	Surface Water Quality Monitoring Data Management Reference Guide
DM&A	Data Management and Analysis
EPA	United States Environmental Protection Agency
FY	Fiscal Year
GPS	Global Positioning System
LCRA-ELS	Lower Colorado River Authority – Environmental Laboratory Services
IBWC	International Boundary and Water Commission
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOQ	Limit of Quantitation
MT	Monitoring Type
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NELAC	National Environmental Laboratories Accreditation Conference
NELAP	National Environmental Laboratory Accreditation Program
NR	Nueces River Authority
NRA	Nueces River Authority
PENS	TAMU-CC Department of Physical and Environmental Sciences
PM	Project Manager
QA	Quality Assurance
QAM	Quality Assurance Manager
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QAS	Quality Assurance Specialist
QC	Quality Control
QM	Quality Manual
QMP	Quality Management Plan
RPD	Relative Percent Difference
RT	Routine Monitoring
SARA REL	San Antonio River Authority Regional Environmental Laboratory
SE	Submitting Entity
SLOC	Station Location
SOP	Standard Operating Procedure
SWQM	Surface Water Quality Monitoring
SWQMIS	Surface Water Quality Monitoring Information System
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TNI	The NELAC Institute
TOC	Total Organic Carbon
TSS	Total Suspended Solids
TSWQS	Texas Surface Water Quality Standards
TWDB	Texas Water Development Board

USACE	United States Army Corps of Engineers
VOA	Volatile Organic Analytes
WUL	City of Corpus Christi Water Utilities Laboratory

A4 Problem Definition/Background

In 1991, the Texas Legislature passed the Texas Clean River Act (Senate Bill 818) in response to growing concerns that water resource issues were not being pursued in an integrated, systematic manner. The act requires that ongoing water quality assessments be conducted for each river basin in Texas, an approach that integrates water quality issues within the watershed. The Clean Rivers Program (CRP) legislation mandates that each river authority (or local governing entity) shall submit quality-assured data collected in the river basin to the commission. Quality-assured data in the context of the legislation means data that comply with Texas Commission on Environmental Quality (TCEQ) rules for surface water quality monitoring (SWQM) programs, including rules governing the methods under which water samples are collected and analyzed and data from those samples are assessed and maintained. This QAPP addresses the program developed between the NRA and the TCEQ to carry out the activities mandated by the legislation. The QAPP was developed and will be implemented in accordance with provisions of the TCEQ Quality Management Plan (QMP), Revision 30 or most recent version.

The purpose of this QAPP is to clearly delineate NRA's Quality Assurance (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. The QAPP is reviewed by the TCEQ to help ensure that data generated for the purposes described above are of known and documented quality and deemed acceptable for their intended use. This process will ensure that data collected under this QAPP and submitted to the Surface Water Quality Monitoring Information System (SWQMIS) have been collected and managed in a way that guarantees its reliability and therefore can be used in water quality assessments, total maximum daily load (TMDL) projects, water quality standards development, permit decisions, and other program activities deemed appropriate by the TCEQ. Project results will be used to support the achievement of CRP objectives, as contained in the *Guidance for Partners in the Texas Clean Rivers Program FY 2026–2027.*

This QAPP provides for the continuation of the San Antonio-Nueces Coastal Basin, Nueces River Basin, Nueces-Rio Grande Coastal Basin, and adjoining bays and estuaries baseline monitoring. See Appendix C for station location maps for each basin. The Nueces River Authority's Clean Rivers Program monitoring is based on water quality concerns and impairments identified in the Texas Integrated Report and input from steering committee members and local agencies collecting water quality data in the basin.

Steering Committee input provides valuable information and helps establish San Antonio-Nueces Coastal Basin, Nueces River Basin, Nueces-Rio Grande Coastal Basin, and adjoining bays and estuaries community priorities with respect to water quality. Three basin monitoring objectives were established to address priority water quality concerns. The basin monitoring objectives are:

1. To provide data for water quality control programs
2. Generate historical water quality trends
3. Identify potential water quality problems

The monitoring objectives also consider water quality data assessments to determine Texas Surface Water Quality Standards (TSWQS) attainment. The remaining sections of this QAPP describe how the objectives will be met.

A5 Project/Task Description

NRA will monitor a minimum of 8 bay and tidal sites quarterly for conventional, bacteria, and field parameters. NRA will monitor 2 bay and tidal locations on a semi-annual basis for conventional, bacteria, and field parameters. NRA will monitor a minimum of 33 river and lake sites quarterly for conventional, bacteria, flow (where applicable), and field parameters. NRA will monitor 2 river locations on a quarterly basis for

chlorophyll-a, total dissolved solids (TDS), bacteria, and field parameters. NRA will monitor quarterly 1 bay and tidal site for field parameters only. NRA will conduct 24-hour dissolved oxygen monitoring at 8 sites quarterly, given sufficient water. NRA will monitor metals in water at 9 locations on a twice per year frequency. NRA will monitor 2 river and lake sites on a semi-annual basis for conventional, bacteria, and field parameters.

Bandera County River Authority and Groundwater District (BCRAGD) will conduct routine quarterly monitoring, collecting field, conventional, bacteria and, where applicable, flow data at 5 river stations in basin 21.

See Appendix B for the project-related work plan tasks and schedule of deliverables for a description of work defined in this QAPP.

See Appendix B for sampling design and monitoring pertaining to this QAPP.

Amendments to the QAPP

Amendments to the QAPP 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 NRA Project Manager (PM) to the TCEQ CRP PM electronically. The NRA will submit a completed QAPP amendment document, including a justification of the amendment, a table of changes, and all pages, sections, and attachments affected by the amendment. Amendments are effective immediately upon approval by the NRA PM, the NRA Quality Assurance Officer (QAO), the TCEQ CRP PM, the TCEQ CRP Lead Quality Assurance Specialist (QAS), the TCEQ CRP Project QAS, the TCEQ CRP Team Leader, the TCEQ Data Management and Analysis (DM&A) Team Leader, and any additional parties affected by the amendment. Amendments are not retroactive. No work shall be implemented without an approved QAPP or amendment prior to the start of work. Any activities under this contract that commence prior to the approval of the governing QA document constitute a deficiency and are subject to corrective action as described in section C1 of this QAPP. Any deviation or deficiency from this QAPP which occurs after the execution of this QAPP will be addressed through a corrective action plan (CAP). An amendment may be a component of a CAP to prevent future recurrence of a deviation.

Amendments will be incorporated into the QAPP by way of attachment and distributed to personnel on the distribution list by the NRA PM. If adherence letters are required, NRA will secure an adherence letter from each sub-tier project participant (e.g., subcontractors, sub-participant, or other units of government) affected by the amendment stating the organization's awareness of and commitment to requirements contained in each amendment to the QAPP. The NRA will maintain this documentation as part of the project's QA records and ensure that the documentation is available for review.

Special Project Appendices

Projects requiring QAPP appendices will be planned in consultation with the NRA, the TCEQ CRP PM, and TCEQ technical staff. Appendices will be written in an abbreviated format and will reference the NRA QAPP where appropriate. Appendices will be approved by the NRA PM, the NRA QAO, the Laboratory (as applicable), the TCEQ CRP PM, the TCEQ CRP Project QAS, the TCEQ Lead QAS, TCEQ CRP Team Leader, the TCEQ DM&A Team Leader, and additional parties affected by the appendix, as appropriate. Copies of approved QAPP appendices will be distributed by the NRA to project participants before data collection activities commence. The NRA will secure written documentation from each sub-tier project participant (e.g., subcontractors, subparticipants, other units of government) stating the organization's awareness of and commitment to requirements contained in each special project appendix to the QAPP. The NRA will maintain this documentation as part of the project's QA records and ensure that the documentation is available for review.

A6 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 TCEQ's Guidance for Assessing and Reporting Surface Water Quality in Texas, February 2024 or most

recent version (https://www.tceq.texas.gov/downloads/water-quality/assessment/integrated-report-2024/2024-guidance.pdf). These water quality data, and data collected by other organizations (e.g., United States Geological Survey [USGS], TCEQ, etc.), will be subsequently reconciled for use and assessed by the TCEQ.

Systematic watershed monitoring, defined as sampling that is planned for a short duration (1 to 2 years), is designed to screen waters that would not normally be included in the routine monitoring (RT) program, investigates areas of potential concern, and investigates possible sources of water quality impairments or concerns. Due to the limitations regarding these data (e.g., not temporally representative, limited number of samples, biological sampling does not meet the specimen vouchering requirements), the data will be used to determine whether any locations have values exceeding the TCEQ's water quality criteria and/or screening levels (or in some cases values elevated above normal). The Nueces River Authority will use this information to determine future monitoring priorities. These water quality data and data collected by other organizations (e.g., USGS, TCEQ, etc.), will be subsequently reconciled for use and assessed by the TCEQ.

NRA collects 24-hour dissolved oxygen monitoring data that can be used to characterize water quality conditions, identifying trends in that 24-hour period to identify potential concerns. The data will be used to determine whether any locations have values exceeding the TCEQ's water quality criteria.

The measurement performance specifications to support the project purpose for a minimum data set are specified in Appendix A.

Ambient Water Reporting Limits (AWRLs)

For surface water to be evaluated for compliance with Texas Surface Water Quality Standards (TSWQS) and screening levels, data must be reported at or below specified reporting limits. To ensure data are collected at or below these reporting limits, required ambient water reporting limits (AWRLs) have been established. A full listing of AWRLs can be found at https://www.tceq.texas.gov/assets/public/waterquality/crp/QA/awrlmaster.pdf.

The limit of quantitation (LOQ) is the minimum reporting limit, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence by the laboratory analyzing the sample. Analytical results shall be reported down to the laboratory's LOQ (i.e., the laboratory's LOQ for a given parameter is its reporting limit) as specified in Appendix A.

The following requirements must be met in order to report results to the CRP:

- The laboratory's LOQ for each analyte must be set at or below the AWRL. It is the responsibility of NRA to ensure that any laboratories used to generate CRP data have satisfactory LOQs.
- Once the LOQ is established in the QAPP, that is the reporting limit for that parameter until such time as the laboratory amends the QAPP and lists an updated LOQ.
- 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.
- Under reasonable circumstances (e.g., the use of a subcontracted lab), data may be reported above or below the LOQ stated in this QAPP, so long as the LOQ remains at or below the AWRL stated in this QAPP.
- Measurement performance specifications for LOQ check samples are found in Appendix A.

Exceptions to LOQs being at or below the AWRL, *including but not limited to*:

SARA-REL: Segment 2204 nitrate nitrogen/nitrite nitrogen will not meet LOQ requirements due to dilution needed to measure chloride and sulfate. High levels of chloride and sulfate in saline or brackish waters can interfere with analyses (e.g. Nitrate, Nitrite, TOC). All anions (chloride, sulfate, nitrate, and nitrite) are run concurrently on the instrument, which is an ion chromatogram. Each has specific retention times off of the analytical column.

- Dilution 1:10, LOQ will be 0.5 mg/L

Laboratory Measurement Quality Control (QC) Requirements and Acceptability Criteria are provided in Section

B4.

Precision

Precision is the degree to which a set of observations or measurements of the same property, obtained under similar conditions, conform to themselves. It is a measure of agreement among replicate measurements of the same property, under prescribed similar conditions, and is an indication of random error.

Laboratory precision is assessed by comparing replicate analyses of laboratory control samples (LCS) in the sample matrix (e.g., deionized water, sand, commercially available tissue), matrix spike/matrix spike duplicate (MS/MSD), or sample/duplicate (DUP) pairs, as applicable. Precision results are compared against measurement performance specifications and used during evaluation of analytical performance. Program-defined measurement performance specifications for precision are defined in Appendix A.

Bias

Bias is the systematic or persistent distortion of a measurement process, which causes errors in one direction (i.e., the expected sample measurement is different from the sample's true value). Bias is a statistical measurement of correctness and includes multiple components of systematic error. Bias is determined through the analysis of LCS and LOQ check samples prepared with verified and known amounts of all target analytes in the sample matrix (e.g., deionized water, sand, commercially available tissue) and by calculating percent recovery. Results are compared against measurement performance specifications and used during evaluation of analytical performance. Program-defined measurement performance specifications for bias are specified in Appendix A.

Representativeness

Site selection, the appropriate sampling regime, comparable monitoring and collection methods, and use of only approved analytical methods will assure that the measurement data represents the conditions at the site. Routine data collected under CRP are considered to be spatially and temporally representative of ambient water quality conditions. Water quality data are collected on a routine frequency and are separated by approximately even time intervals. At a minimum, samples are collected over at least two seasons (to include inter-seasonal variation) and over two years (to include inter-year variation) and include some data collected during an index period (March 15–October 15). Although data may be collected during varying regimes of weather and flow, the data sets will not be biased toward unusual conditions of flow, runoff, or season. The goal for meeting maximum representation of the water body will be tempered by funding availability.

Comparability

Confidence in the comparability of routine data sets for this project and for water quality assessments is based on the commitment of project staff to use only approved sampling and analysis methods and QA/QC protocols in accordance with quality system requirements as described in this QAPP and in TCEQ guidance. Comparability is also guaranteed by reporting data in standard units, by using accepted rules for rounding figures, and by reporting data in a standard format as specified in the Data Management Plan in Section B7.

Completeness

The completeness of the data describes how much of the data are available for use compared to the total potential data. Ideally, 100% of the data should be available. However, the possibility of unavailable data due to accidents, insufficient sample volume, broken or lost samples, etc. is to be expected. Therefore, it will be a general goal of the project(s) that 90% data completion is achieved.

A7 Distribution List

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The TCEQ CRP PM will provide the approved QAPP and any amendments and appendices to TCEQ staff listed in A7 and the NRA. The NRA 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, subparticipants, or other units of government). The NRA will document distribution of the plan and any amendments and appendices, maintain this documentation as part of the project's quality assurance records, and ensure the documentation is available for review.

A8 Project/Task Organization

Description of Responsibilities

TCEQ

Jason Godeaux
Manager, Monitoring and Assessment Section
Responsible for oversight of the implementation of CRP QAPPs, directs the day-to-day management of the section.

Sarah Whitley
Team Leader, Water Quality Standards and Clean Rivers Program
Responsible for TCEQ activities supporting the development and implementation of the Texas CRP. Responsible for verifying that the TCEQ QMP is followed by TCEQ 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, 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.

Sunshyne Hendrix
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 QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Serves on planning team for CRP special projects. Reviews and approves CRP QAPPs in coordination with other CRP staff. Coordinates documentation and monitors implementation of corrective actions for the CRP.

Kiran Freeman
CRP Project Manager
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 QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Coordinates the review and approval of CRP QAPPs in coordination with the TCEQ CRP Project QAS. Ensures maintenance of QAPPs. Assists TCEQ CRP Lead QAS 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 PM. Reviews and approves data and reports produced by contractors. Notifies TCEQ CRP QA Specialists of circumstances that 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.

Cathy Anderson
Team Leader, Data Management and Analysis Team
Participates in the development, approval, implementation, and maintenance of written QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Ensures DM&A staff perform data management-related tasks.

Scott Delgado
CRP Data Manager, Data Management and Analysis Team
Responsible for coordination and tracking of CRP data sets from initial submittal through TCEQ CRP PM review and approval. Ensures that data are reported following instructions in the Data Management Reference Guide (DMRG), July 2019 or most current version. Runs automated data validation checks in SWQMIS and coordinates data verification and error correction with TCEQ CRP PMs. Generates SWQMIS summary reports to assist CRP PMs' data review. Identifies data anomalies and inconsistencies. Provides training and guidance to CRP and planning agencies on technical data issues to ensure that data are submitted according to documented procedures. Reviews QAPPs for valid stream monitoring stations. Checks validity of parameter codes, submitting entity (SE) code(s), collecting entity (CE) code(s), and monitoring type (MT) code(s). Develops and maintains data management-related SOPs for CRP data management. Coordinates and processes data correction requests. Participates in the development, implementation, and maintenance of written QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP).

D. Jody Koehler
TCEQ Quality Assurance Manager
Responsible for coordinating development and implementation of TCEQ's QA program. Provides oversight and guidance for TCEQ's QA program. Responsible for the development and maintenance of the TCEQ QMP. TCEQ's QA Manager, or designated QA staff in the Laboratory and Quality Assurance Section of the Air Monitoring Division, is responsible for review and approval of program/project QAPPs to ensure QAPPs conform to applicable requirements as detailed in TCEQ's QMP.

Loren Walker
CRP Lead Quality Assurance Specialist
Participates in the development, approval, implementation, and maintenance of written QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Assists program manager and TCEQ CRP Project QAS in developing and implementing the quality system. Reviews and approves CRP QAPPs, QAPP amendments, and QAPP special appendices. Prepares and distributes annual audit plans. Conducts monitoring systems audits of planning agencies. Concurs with 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 audit records for the CRP.

Nueces River Authority

Lorie Flores
Director of Resource Protection and Water Quality
Manages overall performance, administration, and deadlines. Responsible for supervision of field personnel involved in generating analytical data for the project. Ensures that field personnel have adequate training and a thorough knowledge of the QAPP, TCEQ's Surface Water Quality Monitoring Procedures, Volumes 1 and 2, and scientific principles of water quality. Ensure the project manager has all necessary equipment and supervises maintenance and upkeep of all equipment. Always ensures safety as top priority. Provides training as needed to meet project requirements or staff interests that support project goals. Responsible for monitoring upcoming deadlines. Outlines steps to obtain monitoring goals to meet project milestones and disseminates information according to water quality staff. Ensures proper completion of all reimbursement requests and other administrational forms, such as the Financial Status Reports in a timely manner, to TCEQ CRP Project Manager. Works with NRA and CRP Project Managers to clearly define project budget requirements. Approves laboratory invoices for payment.

Jessica Wright
Project Manager
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 NRA participants and that projects are producing data of known quality. Ensures that subparticipants are qualified to perform contracted work. Ensures TCEQ CRP PM 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. Maintains quality-assured data on NRA internet sites.

Responsible for writing and maintaining the QAPP and monitoring its implementation. Responsible for maintaining records of QAPP distribution, including appendices and amendments. Responsible for maintaining written records of sub-tier commitment to requirements specified in this QAPP. Responsible for identifying, receiving, and maintaining project QA records. Responsible for coordinating with the TCEQ CRP PM to resolve QA-related issues. Verifies lab billing matches analyses requested and billing code. Works with the laboratory to obtain the appropriate amount of bottles required for sampling.

Courtney Taylor
Quality Assurance Officer and Field Supervisor
Responsible for ensuring that field data are properly reviewed and verified. Verifies results make sense with field observations and scientific background. Double-checks all written values were written in the correct units and rounding. Supervises field and laboratory data entry to the NRA database. Reviews data entered into NRA database and informs NRA Project Manager of any needed corrections. Responsible for the transfer of basin quality-assured water quality data to the TCEQ in a format compatible with SWQMIS.

Responsible for coordinating the implementation of the QA program. Notifies the NRA PM of particular circumstances that may adversely affect the quality of data. Coordinates and monitors deficiencies and corrective action. Coordinates and maintains records of data verification and validation. Coordinates the research and review of technical QA material and data related to water quality monitoring system design and analytical techniques. Conducts monitoring systems audits on project participants to determine compliance with project and program specifications, issues written reports, and follows through on findings. Ensures that field staff is properly trained and that training records are maintained.

Coordinates with NRA PM and Data Specialist on all field sampling and data collection activities. Supervises field personnel in conducting sampling events. Conducts field sampling and data collection activities following procedures outlined in the QAPP. Responsible for completing sample documentation including labeling samples and ensuring the correct sites are identified. Retains copies of all Chain of Custody forms. Responsible for ensuring all instrument calibration data is complete. Ensures that personnel, supplies, and

equipment are available at all appropriate times.

Wesley Harris
Data Specialist
Responsible for completing sample documentation including labeling samples and ensuring the correct sites are identified. Conducts field sampling and data collection activities following procedures outlined in the QAPP. Double-checks all written values were written in the correct units and rounding on field sheets. Enters data into NRA database and informs NRA Project Manager and QAO of any needed corrections. Helps Field Supervisor coordinate bottle drop-offs and pickups from the laboratories. Ensure all data on the field sheet and all blank or missing data is reported to NRA QAO and PM. Completes USGS rainfall and flow data entries in the office with matching station and date. Works with NRA QAO to make sure that rainfall and flow make sense according to sampling field notes.

Corpus Christi Water Utilities Laboratory

Michael McCall
Lab Manager
Responsible for the overall performance, administration, and reporting of analyses performed by the WUL. Responsible for supervision of laboratory personnel involved in generating analytical data for the project. Ensures that laboratory personnel have adequate training and a thorough knowledge of the QAPP and related SOPs. Responsible for oversight of all laboratory operations ensuring that all QA/QC requirements are met, documentation is complete and adequately maintained, and results are reported accurately. Enforces corrective action, as required.

LaDona Parr
Lab QAO
Responsible for the overall quality control and quality assurance of analyses performed by the WUL. Monitors the implementation of the QAPP within the laboratory to ensure complete compliance with QA data quality objectives, as defined by the contract and in the QAPP. Conducts in-house audits to ensure compliance with written SOPs and to identify potential problems. Responsible for supervising and verifying all aspects of the QA/QC in the laboratory.

TAMU-CC PENS

Hao Yu
Lab Research Associate
Responsible for the overall performance, administration, and reporting of analyses performed by PENS. Responsible for supervision of laboratory and field personnel involved in generating analytical data for the project. Ensures that laboratory and field personnel have adequate training and a thorough knowledge of the QAPP and related SOPs. Responsible for oversight of all laboratory operations ensuring that all QA/QC requirements are met, documentation is complete and adequately maintained, and results are reported accurately. Enforces corrective action, as required.

Richard Coffin
Lab QAO
Responsible for the overall quality control and quality assurance of analyses performed by PENS. Monitors the implementation of the QAPP within the laboratory to ensure complete compliance with QA data quality objectives, as defined by the contract and in the QAPP. Conducts in-house audits to ensure compliance with written SOPs and to identify potential problems. Responsible for supervising and verifying all aspects of the QA/QC in the laboratory.

SARA REL

Zachary Jendrusch
Lab Supervisor

Responsible for overall performance, administration, and reporting of analyses performed by SARA REL. Responsible for supervision of laboratory personnel involved in generating analytical data for the project. Ensures that laboratory personnel have adequate training and a thorough knowledge of the QAPP and related SOPs. Responsible for oversight of all laboratory operations ensuring that all QA/QC requirements are met, documentation is complete and adequately maintained, and results are reported accurately. Enforces corrective action, as required. Additionally, the lab supervisor will review and verify all field and laboratory data for integrity and continuity, reasonableness, and conformance to project requirements, and then validated against the data quality objectives listed in Appendix A.

Jeanette Hernandez
Lab QAO

Maintains operating procedures in compliance with the QAPP, amendments and appendices. Responsible for the overall quality control and quality assurance of analyses performed by SARA REL. Monitors the implementation of the QAPP within the laboratory to ensure compliance with QA data quality objectives, as defined in the QAPP. Assists with monitoring systems audits for CRP projects. Conducts in-house audits to ensure compliance with written SOPs and to identify potential problems. Responsible for supervising and verifying all aspects of the QA/QC in the laboratory.

LCRA-ELS

Dale Jurecka
Lab Manager

Responsible for the overall performance, administration, and reporting of analyses performed by LCRA-ELS. Responsible for supervision of laboratory and field personnel involved in generating analytical data for the project. Ensures that laboratory and field personnel have adequate training and a thorough knowledge of the QAPP and related SOPs. Responsible for oversight of all laboratory operations ensuring that all QA/QC requirements are met, documentation is complete and adequately maintained, and results are reported accurately. Enforces corrective action, as required. Supplies field personnel with cooler, field blank, equipment blank, dissolved and total metals blank bottles, and sampling bottles.

Angel Mata
Lab QAO

Responsible for the overall quality control and quality assurance of analyses performed by LCRA-ELS. Monitors the implementation of the QAPP within the laboratory to ensure complete compliance with QA data quality objectives, as defined by the contract and in the QAPP. Conducts in-house audits to ensure compliance with written SOPs and to identify potential problems. Responsible for supervising and verifying all aspects of the QA/QC in the laboratory.

Energy Laboratories, Inc. (Billings, MT)

Cindy Rohrer
Lab Manager

Responsible for the overall performance, administration, and reporting of analyses performed by Energy Laboratories, Inc (Energy Lab). Responsible for supervision of laboratory and field personnel involved in generating analytical data for the project. Ensures that laboratory personnel have adequate training and a thorough knowledge of the QAPP and related SOPs. Responsible for oversight of all laboratory operations ensuring that all QA/QC requirements are met, documentation is complete and adequately maintained, and results are reported accurately. Enforces corrective action, as required. Supplies field personnel with cooler, field blank, equipment blank, mercury blank, dissolved and total metals blank

bottles, and sampling bottles.

Leigh Ann Wise
Lab QAO
Responsible for the overall quality control and quality assurance of analyses performed by Energy Lab. Monitors the implementation of the QAPP within the laboratory to ensure complete compliance with QA data quality objectives, as defined by the contract and in the QAPP. Ensures methods performed meet Texas Surface Water Quality Monitoring Program's Ambient Water Reporting Limits (AWRLs). Conducts in-house audits to ensure compliance with written SOPs and to identify potential problems. Responsible for supervising and verifying all aspects of the QA/QC in the laboratory. Verifies chain of custody requirements are met.

BCRAGD

David Mauk
General Manager
Manages overall performance, administration, and reporting of analyses performed by BCRAGD field staff. Responsible for supervision of field personnel involved in generating analytical data for the project. Ensures that field personnel have adequate training and a thorough knowledge of the QAPP and related SOPs. Responsible for oversight of all field operations ensuring that all QA/QC requirements are met, documentation is complete and adequately maintained, and results are reported accurately. Additionally, the general manager will review and verify all field work and laboratory calibrations for integrity and continuity, reasonableness and conformance to project requirements.

Clint Carter
QAO
Maintains operating procedures in compliance with the QAPP, amendments and appendices. Responsible for the overall quality control and quality assurance of analyses performed by BCRAGD's field staff. Assists with monitoring systems audits for CRP projects. Reviews and verifies all field and laboratory data for integrity and continuity, reasonableness and conformance to project requirements, and then validated against the data quality objectives.

Responsible for coordinating the implementation of the QA program. Responsible for identifying, receiving, and maintaining project quality assurance records. Notifies the NRA QAO of particular circumstances which may adversely affect the quality of data. Coordinates and monitors deficiencies, nonconformance and corrective action. Coordinates and maintains records of data verification and validation. Coordinates their search and review of technical QA material and data related to water quality monitoring system design and analytical techniques.

Clint Carter
Watershed Protection Coordinator / Field Supervisor
Coordinates field sampling and data collection activities and supervises the field personnel in conducting sampling events. Ensures that all field personnel are properly trained and equipped to conduct the necessary monitoring and that all sampling procedures are followed according to the QAPP. Ensures that personnel, supplies, and equipment are available at all appropriate times. Responsible for overseeing the Natural Resource Specialist in completing sample documentation including labeling samples and ensuring the correct sites are identified. Ensures that samples are sent properly to lab for analysis. Responsible for recording all reagents into the reagent log and labeling all reagent bottles in accordance with the Nueces River Authority QAPP and the BCRAGD SOP for CRP. Conducts all pre- and post-calibrations and maintains all sampling equipment.

Shelby Sckittone
Natural Resource Specialist
Conducts field sampling and data collection activities following procedures outlined in the QAPP. Responsible for completing sample documentation including labeling samples and ensuring the correct sites are identified. Ensures that samples are sent properly to lab for analysis.

A9 Project QAM Independence

TCEQ uses a semi-decentralized QA program, which is organizationally independent of operational programs and activities within the agency. TCEQ's QA program has sufficient access and authority to coordinate the development and implementation of the agency's quality system.

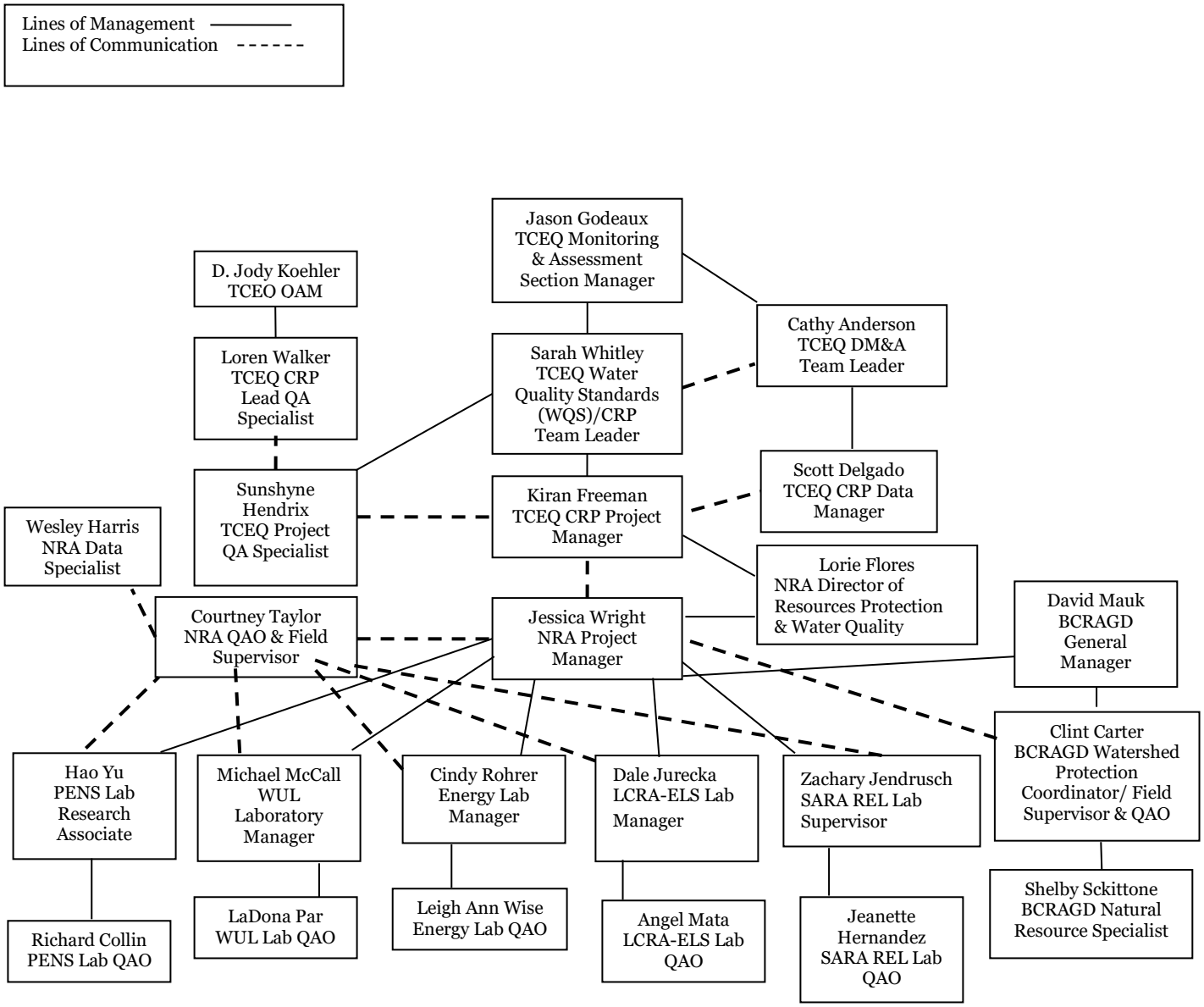
The TCEQ QA Manager (QAM) and designated TCEQ QA staff from the Laboratory and Quality Assurance Section within the Air Monitoring Division of the Office of Air are independent of activities performed by CRP. No CRP staff have authority to sign QAPPs, amendments, or appendices on behalf of TCEQ's QAM or the Lead CRP QAS. Similarly, TCEQ's QAM and the Lead CRP QAS cannot sign QAPPs, amendments or appendices on behalf of CRP staff.

Roles of project QA staff are described in Section A8. An illustration of QA independence and lines of communication and supervision for this project are detailed in the project organization chart in A10. Communication for deficiencies and corrective actions are described in Section C1.

A10 Project Organizational Chart and Communication

Project Organization Chart

Figure A10.1. Organization Chart with Lines of Communication



A11 Special Training/Certification

Before new field personnel independently conduct field work, NRA's Field Supervisor trains them in proper instrument calibration, field sampling techniques, and field analysis procedures. The NRA QAO (or designee) will document the successful field demonstration (Attachment 1). The NRA QAO (or designee) will retain documentation of training and the successful field demonstration in the employee's personnel file (or other designated location) and ensure that the documentation will be available during monitoring systems audits. BCRAGD's Field Supervisor must ensure that new field personnel are trained in accordance with NRA's Special Training. BCRAGD will forward a record of training as needed (Attachment 2). NRA Field Supervisor will keep a record of trainings completed.

The requirements for obtaining certified positional data using a global positioning system (GPS) are located in Section B7, Data Management.

Contractors and subcontractors must ensure that laboratories analyzing samples under this QAPP meet the requirements contained in The National Environmental Laboratories Accreditation Conference (NELAC) Institute Standard (2016) Volume 1, Module 2, Section 4.5 (concerning Subcontracting of Environmental Tests).

A12 Documents and Records

The documents and records that describe, specify, report, or certify activities are listed. The list below is limited to documents and records that may be requested for review during a monitoring systems audit.

Table A12.1 Project Documents and Records

Document/Record	Location	Retention (yrs)	Format
QAPPs, amendments and appendices	NRA, BCRAGD	7*	Paper or electronic
Field SOPs	NRA, BCRAGD	7*	Paper or electronic
Laboratory quality manuals	SARA REL, TAMU-CC PENS, LCRA-ELS, ENERGY, WUL	5	Paper or electronic
Laboratory SOPs	SARA REL, TAMU-CC PENS, LCRA-ELS, ENERGY, WUL	5	Paper or electronic
QAPP distribution documentation	NRA, BCRAGD	7*	Paper or electronic
Field staff training records	NRA, BCRAGD	7*	Paper or electronic
Field equipment calibration/maintenance logs	NRA, BCRAGD	7*	Paper or electronic
Field instrument printouts	NRA, BCRAGD	7*	Paper
Field notebooks or data sheets	NRA, BCRAGD	7*	Paper or electronic
Chain of custody records	NRA, BCRAGD, SARA REL, TAMU-CC PENS, LCRA-ELS, ENERGY, WUL	5+	Paper or electronic
Laboratory calibration records	SARA REL, TAMU-CC PENS, LCRA-ELS, ENERGY, WUL	5	Electronic
Laboratory instrument printouts	SARA REL, TAMU-CC PENS, LCRA-ELS, ENERGY, WUL	5	Paper or electronic

Laboratory data reports/results	SARA REL, TAMUCC PENS, LCRA-ELS, ENERGY, WUL	5	Paper or electronic
	NRA, BCRAGD	7*	
Laboratory equipment maintenance logs	SARA REL, TAMUCC PENS, LCRA-ELS, ENERGY, WUL	5	Paper or electronic
Corrective action documentation	SARA REL, TAMUCC PENS, LCRA-ELS, ENERGY, WUL	5	Paper or electronic
	NRA, BCRAGD	7*	

*NRA and BCRAGD store all documentation including electronic and paper documents at least 7 years.

Laboratory Test Reports

Test/data reports from the laboratory must document the test results clearly and accurately. Routine data reports should be consistent with The NELAC Institute (TNI) Standard (2016), Volume 1, Module 2, Section 5.10 and include the information necessary for the interpretation and validation of data. The requirements for reporting data and the procedures are provided.

- Title of report and unique identifiers on each page
- Name and address of the laboratory
- Name and address of the client
- A clear identification of the sample(s) analyzed
- Date and time of sample receipt
- Identification of method used
- Identification of samples that did not meet QA requirements and why (e.g., holding times exceeded)
- Clearly identified subcontract laboratory results (as applicable)
- A name and title of person accepting responsibility for the report
- Narrative information on QC failures or deviations from requirements that may affect the quality of results or is necessary for verification and validation of data.
- Sample results
- Units of measurement
- Station information
- Date and time of collection
- LOQ and Limit of Detection (LOD) (formerly referred to as the reporting limit and the method detection limit, respectively), and qualification of results outside the working range (if applicable) Certification of NELAP compliance for each parameter reported
- Holding time for *E. coli*.

Electronic Data

Data will be submitted electronically to the TCEQ in the event/result file format described in the most current version of the DMRG, which can be found at https://www.tceq.texas.gov/waterquality/data-management/dmrg_index.html. A completed data review checklist and data summary (see Appendix F) will be included with each data submittal. NRA will include record of the NRA Clean Rivers Program SWQMIS Data Checklist as the front page to the field and lab reports (Appendix F).

NRA receives data from all laboratories and sub-tier participants over email in ".pdf" format. Upon receiving electronic laboratory results, NRA makes a physical copy and stores the data with the field data sheets. Data is submitted 3 times a year electronically to the TCEQ in the Event/Result file format described in the most current version of the DMRG, which can be found at: https://www.tceq.texas.gov/waterquality/data-management/dmrg_index.html.

B1 Sampling Process Design

Sampling under this QAPP is conducted by NRA and BCRAGD. NRA uses the SARA-REL for conventional parameters including bacteria (*E. coli*) and chlorophyll-a, and pheophytin. NRA also uses TAMU-CC PENS for chlorophyll-a and pheophytin analysis and WUL for bacteria and conventional parameters during time constraints. BCRAGD uses the SARA-REL for all routine chemical analysis, including bacteria.

LCRA-ELS and Energy Lab will ship pre-cleaned bottles with nitric acid preservative to NRA staff shortly before samples are collected. NRA will collect dissolved and total metals at each metals monitoring station. Dissolved metals in water samples are field filtered and placed in a re-sealable plastic bag along with the unfiltered total metals in water sample. Samples are shipped to LCRA-ELS for analysis. In order to meet project LOQs, NRA will collect Dissolved Cadmium and Total Mercury during the warmer months and ship samples to Energy Lab.

See Appendix B for sampling process design information and monitoring tables associated with data collected under this QAPP.

B2 Sampling Methods

Field Sampling Procedures

Field sampling will be conducted in accordance with the latest versions of the *TCEQ Surface Water Quality Monitoring Procedures Volume 1: Physical and Chemical Monitoring Methods, 2012* (RG-415) and *Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014* (RG-416), collectively referred to as "SWQM Procedures." Updates to SWQM Procedures are posted to the Surface Water Quality Monitoring Procedures website (https://www.tceq.texas.gov/waterquality/monitoring/swqm_guides.html), and shall be incorporated into the NRA's procedures, QAPP, SOPs, etc., within 60 days of any final published update. Additional aspects outlined in Section B below reflect specific requirements for sampling under CRP and/or provide additional clarification.

Table B2.1 Sample Storage, Preservation, and Handling Requirements

Parameter	Matrix	Container**	Preservation	Sample Volume (mL)	Holding Time
Routine Chemical					
Alkalinity	Water	1, 5, 12	cool to <6° C but >0° C	1000, 4000	14 days
Chloride	Water	1,7, 12	cool to <6° C but >0° C	1000, 250, 4000	28 days
Sulfate	Water	1, 7, 12	cool to <6° C but >0° C	1000, 250, 4000	28 days
Total dissolved solids (TDS)	Water	1, 5,12	cool to <6° C but >0° C	1000, 4000	7 days
Turbidity	Water	12	cool to <6° C but >0° C	4000	48 hours
Total Kjeldahl Nitrogen (TKN)	Water	2, 6*,13	cool to <6° C but >0° C , 1-2 ml conc. H_2SO_4 pH<2	500, 1000	28 days
Ammonia-N	Water	2, 6*, 13	cool to <6° C but >0° C 1-2 ml conc. H_2SO_4 pH<2	500, 1000	28 days
Total Phosphorus	Water	2, 6*, 13	cool to <6° C but >0° C, 1-2 ml conc. H_2SO_4 pH<2	500, 1000	28 days
Total organic	Water	3, 6*, 13	cool to <6° C but	500, 1000	28 days

carbon (TOC)			>0° C, 1-2 ml conc. H_2SO_4 pH<2		
Nitrate	Water	1, 7, 12	cool to <6° C but >0° C	1000, 250, 4000	48 hours
Nitrite	Water	1, 7, 12	cool to <6° C but >0° C	1000, 250, 4000	48 hours
Total suspended solids (TSS)	Water	1, 5, 12	cool to <6° C but >0° C	1000, 4000	7 days
Chlorophyll-a[Δ]	Water	4, 9, 14	cool to <6° C but >0° C	500, 3000, 2000	Filter ≤ 48 hours, Samples must be filtered as soon as possible and filters stored frozen up to 24 days; If pH > 6, the processed filters can be stored up to 24 days after filtration. If pH < 6, the lab will proceed directly to extraction after filtration.
Pheophytin	Water	4, 9, 14	cool to <6° C but >0° C	500, 3000, 2000	Filter ≤ 48 hours, Samples must be filtered as soon as possible and filters stored frozen up to 24 days; If pH > 6, the processed filters can be stored up to 24 days after filtration. If pH < 6, the lab will proceed directly to extraction after filtration.
Microbiological					
E. coli[¢] IDEXX Colilert	Water	8 or 15	cool to <6° C but >0° C, Sodium Thiosulfate	290	8 hours[ᶜ]
Enterococcus	Water	15	cool to <6° C but >0° C, Sodium Thiosulfate	290	8 hours
Metals in Water					
Total Hardness	Water	10	Add HNO_3 (in the lab) to pH < 2	250	6 months
Dissolved Metals	Water	10	Filter at site with 0.45 µm filter, add HNO_3 (in the lab for LCRA, in the field for Energy) to pH < 2	250	6 months
Total Metals	Water	10	Add HNO_3 (in the lab for LCRA, in the field for Energy) to pH < 2	250	6 months
Total Mercury	Water	11	Add HNO_3 (in the field) to pH < 2	250	28 Days

[Δ] Samples are kept in a dark brown polyethylene bottle, as specified in the SWQM Procedures Volume I.
* Samples are acid-preserved and stored on ice immediately upon collection (within 15 minutes)
**See Table B2.2 for container codes and bottle descriptions.
(ᶜ) *E. coli* samples should always be processed as soon as possible and incubated no later than 8 hours from time of collection. When transport conditions necessitate sample incubation after 8 hours from time of collection, the holding time may be extended and samples must be processed as soon as possible and

within 30 hours.

Sample Containers

Sample containers are new, supplied by the laboratories conducting the analyses and are shipped to NRA or BCRAGD or picked up directly. Sample container 6 is preserved upon arrival at site with sulfuric acid. Container 8 and 15 are preloaded with sodium thiosulfate. Acidification of metals in water samples will be performed by LCRA-ELS in the lab after sample collection. NRA will add the HNO3 for Energy Lab samples of Total Mercury and Dissolved Cadmium analysis in the field upon sample collection. Certificates from sample container manufacturers are maintained in a notebook by the laboratory.

Table B2.2 Sample Containers

NRA Sampling Containers		
Container #	**Bottle Description**	**Lab**
1	1000 mL unpreserved Polyethylene bottle	WUL
2	500 mL Polyethylene bottle, preserved in lab	WUL
3	500 mL Glass bottle, preserved in the lab	WUL
4	3000 mL Amber polypropylene	SARA REL
5	4000 mL Cubitainer	SARA REL
6	1000 mL Cubitainer, preserved in field by NRA	SARA REL
7	250 mL High Density Polyethylene Bottle	SARA REL
8	290 mL IDEXX bottle with Sodium Thiosulfate	WUL, SARA REL
9	500 mL Brown polyethylene bottle	TAMU-CC PENS
10	250 mL Polyethylene bottle, HNO3 pre-cleaned & preserved in lab for LCRA-ELS, preserved in field for Energy Lab	LCRA-ELS, Energy Lab
11	250 mL Glass or Teflon bottle, HNO3 pre-cleaned & preserved in field	Energy Lab
	BCRAGD Sampling Containers	
12	4000 mL Cubitainer	SARA REL
13	1000 mL Cubitainer, preserved in the field by BCRAGD	SARA REL
14	2000 mL Brown polyethylene bottle	SARA REL
15	300 mL Whirlpack with Sodium Thiosulfate	SARA REL

Processes to Prevent Contamination

SWQM Procedures outline the necessary steps to prevent contamination of samples, including: direct collection into sample containers, when possible; use of certified containers for organics; and clean sampling techniques for metals. Field QC samples (identified in Section B4) are collected to verify that contamination has not occurred.

Documentation of Field Sampling Activities

Field sampling activities are documented on field data sheets as presented in Appendix D. Flow worksheets,

aquatic life use monitoring checklists, habitat assessment forms, field biological assessment forms, and records of bacteriological analyses (if applicable) are part of the field data record. The following will be recorded for all visits:

- Station ID
- Sampling date
- Location
- Sampling depth
- Sampling time
- Sample collector's name
- Values for all field parameters collected

Additional notes containing detailed observational data not captured by field parameters may include:

- Water appearance
- Weather
- Biological activity
- Recreational activity
- Unusual odors
- Pertinent observations related to water quality or stream uses
- Watershed or instream activities
- Specific sample information
- Missing parameters

Recording Data

For the purposes of this section and subsequent sections, all field and laboratory personnel follow the basic rules for recording information as documented below:

- Write legibly, in indelible ink.
- Make changes by crossing out original entries with a single line strike-out, entering the changes, and initialing and dating the corrections.
- Close-out incomplete pages with an initialed and dated diagonal line.

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

Examples of sampling method requirements or sample design deficiencies include but are not limited to such things as inadequate sample volume due to spillage or container leaks, failure to preserve samples appropriately, contamination of a sample bottle during collection, storage temperature and holding time exceedance, sampling at the wrong site, etc. Any deviations from the QAPP, SWQM Procedures, or appropriate sampling procedures may invalidate data and require documented corrective action. Corrective action may include for samples to be discarded and re-collected. It is the responsibility of the NRA PM, in consultation with the NRA 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 TCEQ CRP PM both verbally and in writing in the project progress reports and by completion of a CAP.

The definition of and process for handling deficiencies and corrective action are defined in Section C1.

Analytical Methods

The analytical methods, associated matrices, and performing laboratories are listed in Appendix A. The authority for analysis methodologies under CRP is derived from the Texas Administrative Code (TAC), Title 30, Chapter 307, in that data generally are generated for comparison to those standards and/or criteria. The TSWQS state "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 SWQM Procedures as amended, 40 Code of Federal Regulations (CFR) 136, or other reliable procedures acceptable to the TCEQ, and in accordance with chapter 25 of this title."

Laboratories collecting data under this QAPP must be accredited by the National Environmental Laboratory Accreditation Program (NELAP) in accordance with TAC, Title 30, Chapter 25. Copies of laboratory quality manuals (QMs) and SOPs shall be made available for review by the TCEQ.

Standards Traceability

All standards used in the field and laboratory are traceable to certified reference materials. Standards preparation is fully documented and maintained in a standards logbook. Each documentation includes information concerning the standard identification, starting materials, including concentration, amount used and lot number; date prepared, expiration date and preparer's initials/signature. The reagent bottle is labeled in a way that will trace the reagent back to preparation.

Analytical Method Deficiencies and Corrective Actions

Deficiencies in field and laboratory measurement systems involve, but are not limited to such things as instrument malfunctions, failures in calibration, blank contamination, quality control samples outside QAPP-defined limits, etc. In many cases, the field technician or lab analyst will be able to correct the problem. If the problem is resolvable by the field technician or lab analyst, then they will document the problem on the field data sheet or laboratory record and complete the analysis. If the problem is not resolvable, then it is conveyed to the applicable supervisor, who will make the determination and notify the NRA QAO if the problem compromises sample results. If the analytical system failure may compromise the sample results, the resulting data will not be reported to the TCEQ. The nature and disposition of the problem is reported on the data report which is sent to the NRA PM. If a CAP is necessary (Figure C1.1), the NRA QAO will submit the CAP to the TCEQ CRP PM in a timely manner for review. Additionally, the NRA PM will summarize the CAP in the associated progress report submitted to the TCEQ CRP PM.

The definition of and process for handling deficiencies and corrective action are explained in detail in Section C1.

The TCEQ has determined that analyses associated with qualifier codes (e.g., "holding time exceedance," "sample received unpreserved," "estimated value") may have unacceptable measurement uncertainty associated with them. This will immediately disqualify analyses from submittal to SWQMIS. Therefore, data with these types of problems should not be reported to the TCEQ. Additionally, any data collected or analyzed by means other than those stated in the QAPP, or data suspect for any reason should not be submitted for loading and storage in SWQMIS. However, when data is lost, its absence will be described in the data summary report submitted with the corresponding data set, and a CAP (as described in Section C1) may be necessary.

Acquired Data

Non-directly measured data, secondary data, or acquired data involves the use of data collected under another project and collected with a different intended use than this project. The acquired data still meets the quality requirements of this project and is defined below. The following data source(s) will be used for this project:

USGS gage station data will be used throughout this project to aid in determining gage height and flow. Rigorous QA checks are completed on gage data by the USGS and the data are approved by the USGS and permanently stored at the USGS. This data will be submitted to the TCEQ under parameter code 00061 (instantaneous flow) or parameter code 74069 (flow estimate) depending on the proximity of the monitoring station to the USGS gage station.

Reservoir stage data are collected every day from the USGS, International Boundary and Water Commission (IBWC), and the United States Army Corps of Engineers (USACE) websites. These data are preliminary and subject to revision. The Texas Water Development Board (TWDB) derives reservoir storage (in acre-feet) from

these stage data (elevation in feet above mean sea level), by using the latest rating curve datasets available. These data are published at the TWDB website at http://waterdatafortexas.org/reservoirs/statewide. Information about measurement methodology can be found on the TWDB website. These data will be submitted to the TCEQ under parameter code 00052 (reservoir stage) and parameter code 00053 (reservoir percent full).

B3 Sample Handling and Custody

Sample Tracking

Proper sample handling and custody procedures ensure the custody and integrity of samples beginning at the time of sampling and continuing through transport, sample receipt, preparation, and analysis.

A sample is in custody if it is in actual physical possession or in a secured area that is restricted to authorized personnel. The chain of custody (COC) form is a record that documents the possession of the samples from the time of collection to receipt in the laboratory. The following information concerning the sample is recorded on the COC form (see Appendix E). The following list of items matches the COC form in Appendix E.

Date and time of collection
Site identification
Sample matrix
Number of containers
Preservative used
Analyses required
Name of collector
Custody transfer signatures and dates and time of transfer

Sample Labeling

Samples from the field are labeled on the container, or on a label, with an indelible marker. Label information includes:

Site identification
Date and time of collection
Preservative added, if applicable
Indication of field-filtration for metals, as applicable
Sample type (i.e. analysis) to be performed

Sample Handling

At each site visited, sample containers are placed in a re-sealable plastic bag and are immediately placed on ice in an ice chest. Chain of custody (COC) forms are filled out noting the station ID, date, and time and corresponding analysis to be completed by laboratory personnel. Samples to WUL and TAMU-CC PENS are delivered immediately to the respective lab after sampling. Samples going to SARA REL that have 48-hour holding times (e.g., Nitrate/Nitrite bottle in Container 7 of Table B2.2) may be shipped the same day of sample collection to SARA REL via FedEx Ground service on ice within 0°C and 6°C in a cooler along with the COC in a zip lock bag with the samples. Samples may also be driven up to SARA REL by NRA the following morning after sample collection. NRA will determine whether to hand-deliver samples or deliver via FedEx Ground according to the method that allows for most laboratory analysis time to meet holding times.

The remaining bottles to SARA REL will be hand delivered and kept within 0°C and 6°C on ice within a cooler within the same week that the samples were collected, ensuring holding times are met. Upon delivery, lab personnel receive the samples and note the temperature of the samples, time, date, and provide a signature on the COCs. Copies of the signed COCs are made and stored with field data sheets

and lab data results at NRA. If unforeseen circumstances prevent NRA from hand delivering the other samples, samples will be shipped to SARA REL via FedEx Ground on ice within 0°C and 6°C in a cooler along with the COC in a zip lock bag with the samples. Records of shipped samples will be retained by NRA and shipment tracking information sent to SARA REL. NRA will reach out to TCEQ PM in the event of an issue of sample delivery. Upon delivery, lab personnel receive the samples and note the temperature of the samples, time, date, and provide a signature on the COC form. Copies of the signed COC forms are made and stored with field data sheets and lab data results at NRA.

For metals sampling to LCRA-ELS, NRA will collect a dissolved metals in water and a total metals in water sample at each metals monitoring station. Dissolved metals in water samples are field-filtered and placed in a re-sealable plastic bag along with the non-filtered total metals in water sample. Samples are then placed in an ice chest (no ice is required) with the COC sealed in a waterproof storage bag inside the cooler. The cooler is then sealed with duct tape and a signed and dated chain of custody seal for shipment.

For metals sampling to Energy Lab, dissolved cadmium samples are collected in Container 10, filtered and preserved in-field. Total mercury samples are non-filtered and preserved in Container 11. Both containers 10 and 11 are placed in re-sealable plastic bags and stored into an ice chest with bagged ice and COC form completed. The cooler is wrapped with tape and ready for shipment.

Samples are then shipped in their respective coolers to LCRA-ELS and Energy Lab for analysis. Upon delivery, lab personnel receive the samples and note the temperature of the samples, time, date, and provide a signature on the COC form.

Samples obtained by BCRAGD are immediately placed on ice in an ice chest for transport back to BCRAGD offices. COC forms provided by the SARA REL are filled out noting the station ID, date, and time and corresponding analysis to be completed by laboratory personnel. The ice chest with the COC forms is then sealed for transport to SARA REL by courier. Upon delivery, lab personnel receive the samples and note the temperature of the samples, time, date, and provide a signature on the COC form.

Sample Tracking Procedure Deficiencies and Corrective Action

All deficiencies associated with COC procedures, as described in this QAPP, are immediately reported to the NRA PM. These include such items as delays in transfer resulting in holding time violations; violations of sample preservation requirements; incomplete documentation, including signatures; possible tampering of samples; broken or spilled samples; etc. The NRA PM, in consultation with the NRA QAO, will determine if the procedural violation may have compromised the validity of the resulting data. Any failures that have reasonable potential to compromise data validity will invalidate data and the sampling event should be repeated. The resolution of the situation will be reported to the TCEQ CRP PM in the project progress report. CAPs will be prepared by the NRA and submitted to TCEQ CRP PM.

The definition of and process for handling deficiencies and corrective action are defined in Section C1.

B4 Quality Control

Sampling Quality Control Requirements and Acceptability Criteria

The minimum field QC requirements, and program-specific laboratory QC requirements, are outlined in SWQM Procedures. Specific requirements are outlined below. Field QC sample results are submitted with the laboratory data report (see Section A12).

Field blank

Field blanks are required for total metals-in-water samples when collected without sample equipment (i.e., as grab samples). For other types of samples, they are optional. A field blank is prepared in the field by filling a clean container with pure deionized water and appropriate preservative, if any, for the specific sampling activity being undertaken. Field blanks are used to assess contamination from field sources, such as airborne materials, containers, or preservatives. Field blanks for total metals-in-water samples will be collected at a frequency of one

per day of sampling. Only those samples collected on dates with associated field blanks collected on the same day will be submitted to TCEQ.

The analysis of field blanks should yield values lower than the LOQ. When target analyte concentrations are high, blank values should be lower than 5% of the lowest value of the batch, or corrective action will be implemented.

Field blanks are associated with batches of field samples. In the event of a field blank failure for one or more target analytes, all applicable data associated with the field batch may need to be qualified as not meeting project QC requirements, and these qualified data will not be reported to the TCEQ. These data include all samples collected on that day during that sample run and should not be confused with the laboratory analytical batch.

Field equipment blank

Field equipment blanks are required for metals-in-water samples when collected using sampling equipment. The field equipment blank is a sample of analyte-free media which has been used to rinse common sampling equipment to check the effectiveness of decontamination procedures. It is collected in the same type of container as the environmental sample, preserved in the same manner, and analyzed for the same parameter. The minimum frequency requirement for field equipment blanks is specified in the SWQM Procedures.

The analysis of field equipment blanks should yield values lower than the LOQ, or, when target analyte concentrations are very high, blank values must be less than 5% of the lowest value of the batch, or corrective action will be implemented.

Field equipment blanks are associated with batches of field samples. In the event of a field equipment blank failure for one or more target analytes, all applicable data associated with the field batch may not be qualified as meeting project QC requirements and will not be reported to the TCEQ. This data includes all samples collected on that day during the associated sample run and should not be confused with the laboratory analytical batch.

Laboratory Measurement Quality Control Requirements and Acceptability Criteria

Batch

A batch is defined as environmental samples that are prepared and/or analyzed together with the same process and personnel, using the same lot(s) of reagents. A preparation batch is composed of one to 20 environmental samples of the same NELAP-defined matrix, meeting the above-mentioned criteria and with a maximum time between the start of processing of the first and last sample in the batch to be 24 hours. An analytical batch is composed of prepared environmental samples (extract, digestates, or concentrates) which are analyzed together as a group. An analytical batch can include prepared samples originating from various environmental matrices and can exceed 20 samples.

Method Specific QC requirements

QC samples, other than those specified later in this section (e.g., sample duplicates, surrogates, internal standards, continuing calibration samples, interference check samples, positive control, negative control, and media blank), are run as specified in the methods and in SWQM Procedures. The requirements for these samples, their acceptance criteria or instructions for establishing criteria, and corrective actions are method-specific.

Detailed laboratory QC requirements and corrective action procedures are contained within the individual laboratory QMs. The minimum requirements that all participants abide by are stated below.

Comparison Counting

For routine bacteriological samples, repeat counts on one or more positive samples are required, at least monthly. If possible, the analyst will compare counts with another analyst who also performs the analysis. Replicate counts by the same analyst should agree within 5 percent, and those between analysts should agree within 10 percent. The analyst(s) will record the results.

Limit of Quantitation (LOQ)
The laboratory will analyze a calibration standard (if applicable) at the LOQ published in Appendix A of this QAPP on each day calibrations are performed. In addition, an LOQ check sample will be analyzed with each analytical batch. Calibrations including the standard at the LOQ listed in Appendix A will meet the calibration requirements of the analytical method, or corrective action will be implemented.

LOQ Check Sample
An LOQ check sample consists of a sample matrix (e.g., deionized water, sand, commercially available tissue) free from the analytes of interest spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes. It is used to establish intra-laboratory bias to assess the performance of the measurement system at the lower limits of analysis. The LOQ check sample is spiked into the sample matrix at a level less than or equal to the LOQ published in Appendix A of this QAPP, for each analyte for each analytical batch of CRP samples run. If it is determined that samples have exceeded the high range of the calibration curve, samples should be diluted or run on another curve. For diluted or high concentration samples run on batches with calibration curves that do not include the LOQ published in Appendix A of this QAPP, a check sample will be run at the low end of the calibration curve.

The LOQ check sample is carried through the complete preparation and analytical process and is performed at a rate of one per analytical batch.

The percent recovery of the LOQ check sample is calculated using the following equation in which %R is percent recovery, S_R is the sample result, and S_A is the reference concentration for the check sample:

$$\%R = {}^{S_R}/_{S_A} \times 100$$

Measurement performance specifications are used to determine the acceptability of LOQ check sample analyses as specified in Appendix A of this QAPP.

Laboratory Control Sample (LCS)
An LCS consists of a sample matrix (e.g., deionized water, sand, commercially available tissue) free from the analytes of interest spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes. It is used to establish intra-laboratory bias to assess the performance of the measurement system. The LCS is spiked into the sample matrix at a level less than or near the midpoint of the calibration for each analyte. In cases of test methods with very long lists of analytes, LCSs are prepared with all the target analytes and not just a representative number, except in cases of organic analytes with multipeak responses.

The LCS is carried through the complete preparation and analytical process and is performed at a rate of one per preparation batch.

Results of LCSs are calculated by percent recovery (%R), which is defined as 100 times the measured concentration, divided by the true concentration of the spiked sample.

The following formula is used to calculate percent recovery, where %R is percent recovery; S_R is the measured result; and S_A is the true result:

$$\%R = {}^{S_R}/_{S_A} \times 100$$

Measurement performance specifications are used to determine the acceptability of LCS analyses as specified in Appendix A.

Laboratory Duplicates
A laboratory duplicate is an aliquot taken from the same container as an original sample under laboratory conditions and processed and analyzed independently. A laboratory duplicate is achieved by preparing 2 separate aliquots of a sample, LCS, or matrix spike. Both samples are carried through the entire preparation and analytical process. Laboratory duplicates are used to assess precision and are performed at a rate of one per

preparation batch.

For most parameters except bacteria, precision is evaluated using the relative percent difference (RPD) between duplicate results as defined by 100 times the difference (range) of each duplicate set, divided by the average value (mean) of the set. For duplicate results, X_1 and X_2, the RPD is calculated from the following equation:

$$RPD = \frac{|X_1 - X_2|}{\left(\frac{X_1 + X_2}{2}\right)} \times 100$$

If the precision criterion is exceeded, the data are not acceptable for use under this project and are not reported to TCEQ. Results from all samples associated with that failed duplicate (usually a maximum of 10 samples) are considered to have excessive analytical variability and are qualified as not meeting project QC requirements.

For bacteriological parameters, precision is evaluated using the results from laboratory duplicates. Bacteriological duplicates are analyzed at a 10% frequency (or once per preparation batch, whichever is more frequent). Sufficient volume should be collected to analyze laboratory duplicates from the same sample container.

The base-10 logarithms of the results from the original sample and its duplicate are calculated. The absolute value of the difference between the two base-10 logarithms is calculated and compared to the precision criterion in Appendix A.

$$|\text{Log A} - \text{Log B}| = \text{Log Range}$$

If the difference in logarithms is greater than the precision criterion, the data are not acceptable for use under this project and are not reported to TCEQ. Results from all samples associated with that failed duplicate (usually a maximum of 10 samples) are considered to have excessive analytical variability and are qualified as not meeting project QC requirements.

The precision criterion in Appendix A for bacteriological duplicates applies only to samples with concentrations > 10 MPN.

Laboratory equipment blank

Laboratory equipment blanks are prepared at the laboratory where collection materials for metals sampling equipment are cleaned between uses. These blanks document that the materials provided by the laboratory are free of contamination. The QC check is performed before the metals sampling equipment is sent to the field. The analysis of laboratory equipment blanks should yield values less than the LOQ. If the result is not less than the LOQ, the equipment should not be used.

Matrix spike

Matrix spikes are prepared by adding a known quantity of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

Matrix spikes indicate the effect of the sample on the precision and accuracy of the results generated using the selected method. Matrix-specific QC samples indicate the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. The information from these controls is sample/matrix specific and would not normally be used to determine the validity of the entire batch. The frequency of matrix spikes is specified by the analytical method, or a minimum of one per preparation batch, whichever is greater. To the extent possible, matrix spikes prepared and analyzed over the course of the project should be performed on samples from different sites.

The components to be spiked shall be as specified by the mandated analytical method. The results from matrix spikes are primarily designed to assess the validity of analytical results in a given matrix and are expressed as percent recovery (%R).

The percent recovery of the matrix spike is calculated using the following equation, where %R is percent recovery, S_{SR} is the concentration measured in the matrix spike, S_R is the concentration in the parent sample,

and S_A is the concentration of analyte that was added:

$$\%R = \frac{S_{SR} - S_R}{S_A} \times 100$$

Matrix spike recoveries are compared to the same acceptance criteria established for the associated LCS recoveries, rather than the matrix spike recoveries published in the mandated test method. The EPA 1993 methods (i.e. ammonia-nitrogen, ion chromatography, TKN) that establish matrix spike recovery acceptance criteria are based on recoveries from drinking water that has very low interferences and variability and do not represent the matrices sampled in the CRP. If the matrix spike results are outside laboratory-established criteria, there will be a review of all other associated quality control data in that batch. If all of quality control data in the associated batch passes, it will be the decision of the lab's QAO or NRA PM to report the data for the analyte that failed in the parent sample to TCEQ or to determine that the result from the parent sample associated with that failed matrix spike is considered to have excessive analytical variability and does not meet project QC requirements. Depending on the similarities in composition of the samples in the batch, NRA may consider excluding all of the results in the batch related to the analyte that failed recovery

Method blank

A method blank is a sample of matrix similar to the batch of associated samples (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as the samples through all steps of the analytical procedures, and in which no target analytes or interferences are present at concentrations that impact the analytical results for sample analyses. The method blank is used to document contamination from the analytical process. The analysis of method blanks should yield values less than the LOQ. For very high-level analyses, the blank value should be less than 5% of the lowest value of the batch, or corrective action will be implemented. Samples associated with a contaminated blank shall be evaluated as to the best corrective action for the samples (e.g., reprocessing, data qualifying codes). In all cases, the corrective action must be documented.

The method blank shall be analyzed at a minimum of one per preparation batch. In those instances for which no separate preparation method is used (e.g., VOA) the batch shall be defined as environmental samples that are analyzed together with the same method and personnel, using the same lots of reagents, not to exceed the analysis of 20 environmental samples.

Quality Control or Acceptability Requirements, Deficiencies, and Corrective Actions

Sampling QC excursions are evaluated by the NRA PM, in consultation with the NRA QAO. In that differences in sample results are used to assess the entire sampling process, including environmental variability, the arbitrary rejection of results based on pre-determined limits is not practical. Therefore, the professional judgment of the NRA PM and QAO will be relied upon in evaluating results.

Field blanks for trace elements and trace organics are scrutinized very closely. Field blanks are associated with batches of field samples. In the event of a field blank failure, any target analytes in the ambient sample associated with the field blank should be qualified as not meeting project QC requirements. Notations of blank contamination are noted in the data summaries that accompany data deliverables. Equipment blanks for metals analysis are also scrutinized very closely.

Laboratory measurement quality control failures are evaluated by the laboratory staff. The disposition of such failures and the nature and disposition of the failure is reported to the Laboratory QAO. The Laboratory QAO will discuss the failure with the NRA PM. If applicable, the NRA PM will include this information in a CAP and submit the CAP to the TCEQ CRP PM.

The definition of and process for handling deficiencies and corrective action are defined in Section C1.

Additionally, in accordance with CRP requirements and the TNI Standard (Volume 1, Module 2, Section 4.5, Subcontracting of Environmental Tests) when a laboratory that is a signatory of this QAPP finds it necessary and/or advantageous to subcontract analyses, the laboratory that is the signatory on this QAPP must ensure that

the subcontracting laboratory is NELAP-accredited (when required) and understands and follows the QA/QC requirements included in this QAPP. This includes confirming that the sub-contracting laboratory has LOQs at or below TCEQ AWRLs and performs all required QC analysis outlined in this QAPP. The signatory laboratory is also responsible for QA of the data prior to delivering it to the NRA, including review of all applicable QC samples related to CRP data. As stated in section 4.5.5 of the TNI Standard, the laboratory performing the subcontracted work shall be indicated in the final report and the signatory laboratory shall make a copy of the subcontractor's report available to the client (NRA) when requested.

B5 Instrument/Equipment Calibration, Testing, Inspection, and Maintenance

All sampling equipment testing and maintenance requirements are detailed in the SWQM Procedures. Sampling equipment is inspected and tested upon receipt and is assured appropriate for use by NRA Field Supervisor. Equipment records are kept on all field equipment and a supply of critical spare parts is maintained.

All laboratory tools, gauges, instrument and equipment testing and maintenance requirements are contained within laboratory QM(s).

Instrument Calibration and Frequency

Field equipment calibration requirements are contained in the SWQM Procedures. Post-calibration check error limits and the disposition resulting from errors are adhered to. Data collected from field instruments that do not meet the post-calibration check error limits specified in the SWQM Procedures will not be submitted for inclusion into SWQMIS.

Detailed laboratory calibrations are contained within the QM(s).

B6 Inspection/Acceptance of Supplies and Consumables

The procurement of supplies, equipment, and services is controlled to ensure that specifications are met for the high quality and reliability required for each field and laboratory function. Specifications for all equipment and material used by NRA personnel are outlined in the SWQM Procedures.

Equipment and materials are purchased by NRA and BCRAGD. Upon arrival of materials or equipment, a designated NRA or BCRAGD employee receives and signs for the materials. The program staff that initiated the order is responsible for inspecting and verifying equipment and supplies upon receipt. Items are reviewed to verify that the shipment is complete, and the items are then delivered to the proper location. All chemicals are dated upon receipt. All supplies are stored appropriately and given appropriate disposal upon expiration date.

Laboratories inspect and accept supplies and consumables according to approved analytical methods and other relevant laboratory standards and procedures. Detailed acceptance and inspection criteria are contained within the QM(s).

B7 Data Management

Data Management Process

NRA's field data sheets are used to record field and acquire data (streamflow and precipitation information) from each monitoring station for each sampling event. Laboratory data results from WUL, LCRA-ELS, Energy Lab, TAMU-CC PENS, and SARA REL is sent to NRA via email following each sampling event.

BCRAGD submits field data and SARA REL lab results to NRA electronically via email.

NRA staff transcribes data and uploads photographs from each sampling event (NRA and BCRAGD) to NRA's online data entry forms called DataIn Scripts. Data is input into the database based on the source or type of data. There is an online form for 24-hour dissolved oxygen data, routine CRP data analyzed by WUL, LCRA-ELS, Energy Lab, SARA REL, and TAMU-CC PENS, and one for profile measurements. Each input form includes the field parameters. There is an additional input form for adding pictures. The data is stored in NRA's temporary database. The data are extracted from this database and formatted for submittal to TCEQ.

The forms are designed to limit the amount of information that has to be typed in order to reduce typographical errors. The forms contain: a drop-down list of stations associated with each input type; input fields associated with the event record include the tag number, date, time, depth, source codes, program code, comment, and quarter. The quarter field is only used in NRA's temporary database. The forms also include the results records information via input fields for all field parameters and lab parameters. Where applicable, outliers are flagged via an associated input field. The information entered into the database by the Data Specialist it's then printed and double-checked against the field data sheets and lab results pages by the NRA Field Supervisor. Data entry errors are corrected by NRA QAO and initialed as corrected on database printed sheet. NRA PM consolidates all field lab results, and finalized database input paperwork, into a single file.

The data will be supplied to the TCEQ CRP PM as ASCII pipe-delimited text files in the Event/Result file formats as described in the most current version of the DMRG. The data files are then forwarded to the TCEQ Data Manager.

After approval by TCEQ and inclusion in SWQMIS, the data are entered into NRA's CRP database table that is available online. There are two loading procedures:

- Procedure 1: Once a month, non-NRA data are downloaded from SWQMIS via the "CRP Data Tool" (https://www80.tceq.texas.gov/SwqmisWeb/public/crpweb.faces) website for all segments within NRA's area of responsibility. The event and result files are formatted for upload into NRA's database. A script is run that loads these data into NRA's database. This allows not only new data to be inserted, but data that has been modified in the SWQMIS database to be updated in the NRA's database.

- Procedure 2: NRA data are loaded using the event and result files that were used for the data submittal after they have been approved. NRA's data are loaded separately to preserve NRA's tag assignment to the profile data.

Errors discovered in these records after inclusion in SWQMIS are manually corrected in NRA databases by the NRA QAO/ PM. Notification of discovered errors is provided to TCEQ CRP PM by NRA PM.

The following flow chart summarizes the data path.

Field and Lab Data Results
↓
NRA Online Forms
↓
NRA Database Table
↓
Extract Event and Result files for data submittal
↓
TCEQ CRP Project Manager
↓
TCEQ Data Manager
↓
SWQMIS or Approved Text Files

↓
NRA Online Database

Data Dictionary
Terminology and field descriptions are included in the 2019 DMRG, or most recent version.

Name of Entity	Tag Prefix	Submitting Entity	Collecting Entity
Nueces River Authority	O	NR	NR
Bandera County River Authority and Groundwater District	O	NR	BA

Data Errors and Loss

Time of lab analysis is compared to holding times for all parameters by WUL, TAMU-CC PENS, BCRAGD, SARA REL, LCRA-ELS, Energy Lab and NRA. In the event that a holding time is not met, the accompanying narrative is reviewed for an explanation and/or validity of the reported data. This information is entered into the comment field of the event table and the data exceeding the holding times is excluded from the reported data set, if applicable.

To detect and correct errors prior to submission to TCEQ, the scripts that convert the data entered in the online forms check the entered value against the parameter codes minimum and maximum accepted values. In the event that the data are outside the range, the script returns an error message instructing the user to either reenter the data or to verify the value and place a "1" in an associated box that is equivalent to the "Remark" field of the results table. Date and time entries must also be in valid formats for the scripts to process the data. A report of the records that were added to the table is displayed which can be used to review the data against the field and laboratory data sheets.

Record Keeping and Data Storage

All hardcopy field and lab data sheets are stored in files associated with the quarter in which the sampling occurred. The database is located on a Windows NT server housed at both NRA offices. The CRP database consists of three tables: *parameters*, which contains storet information; *swqm*, which contains information on all sampling stations within NRA's area of responsibility; and *results*, which contains all the sampling event and result information and data.

The NRA PM backs up the CRP database, web pages, and scripts monthly, on or about the first of each month. The database tables are exported to sql and csv files. Listings of the current month's updated records for the individual segments, the web pages and scripts are also copied. These files are copied to a secure cloud server online.

Data Handling, Hardware, and Software Requirements

SERVER HARDWARE #1:	Dell Server
SERVER DATABASE SOFTWARE #1:	Microsoft-IIS/6.0 - MySQL build 5.0.51a
SERVER SOFTWARE #1:	Windows NT SDFMAXVCUS0303 5.2 build 3790
SERVER_PROTOCOL #1:	HTTPS
SERVER HARDWARE #2:	Altec Custom Build
SERVER BACKUPSOFTWARE SOFTWARE #2:	Bluehost Online

SERVER SOFTWARE #2:	Windows 11
SERVER_PROTOCOL #2:	HTTP/1.1
PROGRAMMING LANGUAGE SUPPORT:	PERL, JAVASCRIPT, HTML, XHTML, PHP, SQL, BASH SHELL SCRIPTNG, JAVA, ACTIVE PERL, FLASH and ACTIVEX, PYTHON, C++
DATABASE SUPPLEMENTAL SOFTWARE APPLICATIONS:	Microsoft 365, WordPress
DATABASE SUPPLEMENTAL GRAPICS SOFTWARE APPLICATIONS:	FLASH MX, JASC Paint Shop Pro XI and JASC Animation Shop.
MIDDLEWARE	DBI/DBD, CGI/FastCGI, Active X Controls, Mozilla, MSIE, Netscape, and Opera.
DATABASE PRINTER SUPPLEMENTAL HARDWARE/SOFTWARE:	HP Color Laser Jet 4500DN, HP Office Jet 7410 All-In-One and Xerox Workcentre 7232.

Information Resource Management Requirements

Data will be managed in accordance with the TCEQ DMRG (most recent revision) and applicable NRA's information resource management policies.

GPS equipment may be used as a component of the information required by the station location (SLOC) request process for creating the certified positional data that will ultimately be entered into SWQMIS database. Positional data obtained by CRP grantees using a GPS will follow the TCEQ's OPP 8.11 policy regarding the collection and management of positional data. Positional data may be acquired with a GPS and verified with photo interpolation using a certified source, such as Google Earth or Google Maps. The verified coordinates and map interface can then be used to develop a new SLOC.

C1 Assessments and Response Actions

The following table presents the types of assessments and response actions for data collection activities applicable to the QAPP.

Table C1.1 Assessments and Response Requirements

Assessment Activity	Approximate Schedule	Responsible Party	Scope	Response Requirements
Status Monitoring Oversight	Continuous	NRA	Monitoring of the project status and records to ensure requirements are being fulfilled	Report to TCEQ in quarterly report. Submit CAPs to TCEQ as needed.
Monitoring Systems Audit of Basin Planning Agency	Dates to be determined by TCEQ CRP	TCEQ	Field sampling, handling and measurement; facility review; and data management as they relate to CRP	30 days to provide corrective actions response to the TCEQ
Monitoring Systems Audit of Program Subparticipants	Once per biennium	NRA	Field sampling, handling and measurement; facility review; and data management as they relate to CRP	30 days to respond in writing to NRA. NRA will report findings to TCEQ in progress report.
Laboratory Assessment	Dates to be determined by TCEQ	TCEQ Laboratory Assessor	Analytical and quality control procedures employed at the laboratory and the contract laboratory	30 days to provide corrective actions response to the TCEQ

Corrective Action Process for Deficiencies

Deficiencies are any deviation from the QAPP, SWQM Procedures, DMRG, SOPs, or other applicable guidance documents. Deficiencies may invalidate resulting data and require corrective action. Deficiencies that can be prevented from occurring again in the future require a CAP. TCEQ QA staff recognize that deficiencies may occur that are out of the control of NRA staff and/or their sub participant's staff. Such deficiencies do not require a CAP. However, when a deficiency impacts data quality or quantity, the TCEQ CRP PM must be notified (within three business days of discovery) and the data loss noted in the associated monitoring activities report and data summary. Corrective action for deficiencies may include for samples to be discarded and re-collected. Deficiencies are documented in logbooks, field data sheets, etc. by field or laboratory staff, are communicated to the NRA PM (or other appropriate staff) and should be subject to periodic review so their responses can be uniform, and their frequency tracked. It is the responsibility of the NRA PM, in consultation with the NRA QAO, to ensure that the actions and resolutions to the problems are documented and that records are maintained in accordance with this QAPP.

TCEQ staff are tasked with reviewing CAPs written by NRA concerning deficiencies associated with CRP work. This includes the TCEQ CRP Team Leader, PM, Project QAS, and Lead QAS. The NRA PM or QAO should submit CAPs to their assigned TCEQ CRP PM in a timely manner. NRA can begin implementing corrective actions without TCEQ approval. However, TCEQ may request alternate or modified corrective actions if deemed necessary.

A template for writing CAPs is provided in the *Guidance for Partners in the Texas Clean Rivers Program FY 2026–2027* (Exhibit 2C). While CAPs need not adhere to this specific format, they must include information for all of the listed elements. Incomplete CAPs will be returned to the NRA QAO for revision. All CAPs for a FY should be cataloged in the quarterly progress reports submitted to the TCEQ CRP PM by the NRA PM. This documentation should include, at a minimum, the report number, date(s) of deficiency occurrence, description of deficiency, action taken, CAP status, and the date the CAP was closed (if applicable).

Significant conditions that, if uncorrected, could have a serious effect on safety or on the validity or integrity of data will be reported to the TCEQ immediately.

The NRA PM is responsible for ensuring that corrective actions have been implemented and tracks deficiencies and corrective actions. Records of audit findings and corrective actions are maintained by NRA PM. Audit reports and associated corrective action documentation will be submitted to the TCEQ with the quarterly progress reports.

If audit findings and corrective actions cannot be resolved, then the authority and responsibility for terminating work are specified in the TCEQ QMP and in agreements in contracts between participating organizations.

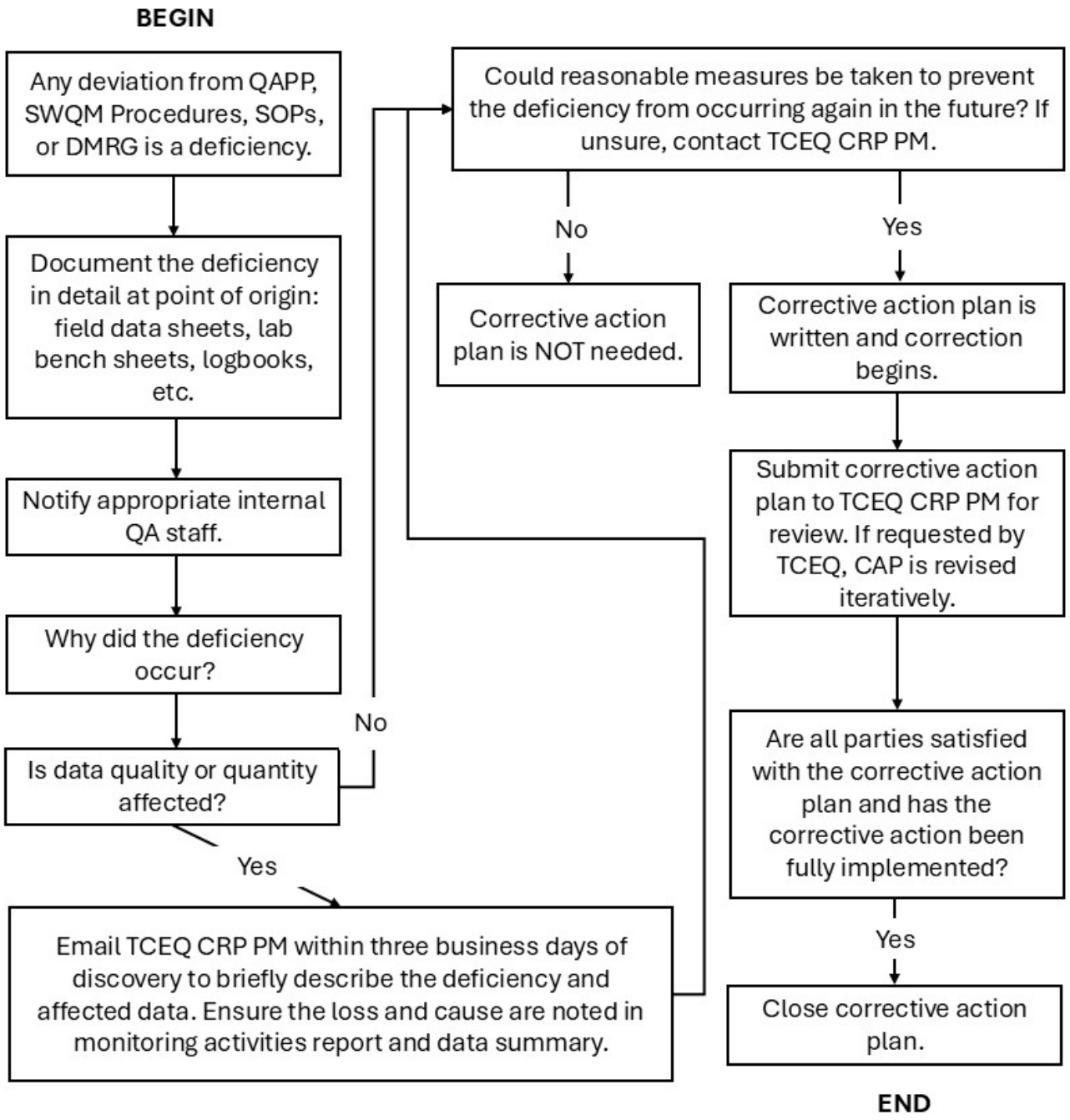
Corrective Action

CAPs should:

- Identify the problem, nonconformity, or undesirable situation
- Identify immediate remedial actions if possible
- Identify the underlying cause(s) of the problem
- Describe the programmatic impact
- Identify whether the problem is likely to recur, or occur in other areas
- Assist in determining the need for corrective action and actions to prevent reoccurrence
- Employ 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 and action(s) to prevent reoccurrence

A flow chart has been developed to facilitate the process (see Figure C1.1: Corrective Action Process for Deficiencies).

Figure C1.1 Corrective Action Process for Deficiencies



C2 Reports to Management

Table C2.1 QA Management Reports

Type of Report	Frequency (daily, weekly, monthly, quarterly, etc.)	Projected Delivery Date(s)	Person(s) Responsible for Report Preparation	Report Recipients
Corrective Action Plans	As Needed	As Needed	Field Staff Laboratory Staff	NRA QA Staff or Laboratory Management as appropriate, TCEQ CRP Project Manager
Progress Reports	Quarterly	December 15, 2025 March 15, 2026 June 15, 2026 September 15, 2026 December 15, 2026 March 15, 2027 June 15, 2027 August 15, 2027	NRA PM	TCEQ CRP Project Manager
Monitoring Systems Audit Report and Response	As Needed	As Needed	NRA QAO	TCEQ CRP Project Manager
Data Summary	As Needed	As Needed	NRA QAO	TCEQ CRP Project Manager

Reports to Nueces River Authority Project Management

QA issues will be reported in writing (e-mail) to the NRA PM as issues arise.

The NRA PM is charged with the responsibility to report the status of implementation and application of the quality assurance procedures described in this QAPP and thereby the status of data quality. It is imperative that the NRA PM is properly informed of any quality assurance problems encountered and assists in the development and implementation of corrective actions. This information will be provided to the NRA PM by the NRA Data Specialist and/or Field Personnel (NRA and BCRAGD). These reports will include laboratory analysis, quality assurance summaries and field QC results. These reports will be provided to the NRA PM/QAO as needed prior to the transfer of the data to the TCEQ. Other reports as needed include, but are not limited to corrective action forms, correspondence, case narratives, etc., describing corrective actions or implementation of new processes to ensure that quality data are produced.

Reports to TCEQ Project Management

All reports detailed in this section are contract deliverables and are transferred to the TCEQ in accordance with contract requirements.

Progress Report

Summarizes the NRA's activities for each task; reports monitoring status, problems, delays, deficiencies, status of open CAPs, and documentation for completed CAPs; and outlines the status of each task's deliverables.

Monitoring Systems Audit Report and Response

Following any audit performed by the NRA, a report of findings, recommendations and response is sent to the

TCEQ in the quarterly progress report.

Data Summary
Contains basic identifying information about the data set and comments regarding inconsistencies and errors identified during data verification and validation steps or problems with data collection efforts (e.g., deficiencies).

Reports by TCEQ Project Management

Contractor Evaluation
The NRA participates in a contractor evaluation by the TCEQ annually for compliance with administrative and programmatic standards. Results of the evaluation are submitted to the TCEQ Financial Administration Division, Procurement and Contracts Section.

D1 Data Review, Verification, and Validation

All field and laboratory data will be reviewed and verified for integrity, continuity, reasonableness, and conformance to project requirements, and then validated against the project objectives and measurement performance specifications which are listed in Section A6 of this QAPP. Only those data which are supported by appropriate quality control data and meet the measurement performance specifications defined for this project will be considered acceptable and will be reported to the TCEQ for entry into SWQMIS.

Verification and Validation Methods

All field and laboratory data will be reviewed, verified and validated to ensure they conform to project specifications.

Data review, verification, and validation will be performed using self-assessments as well as peer and management review as appropriate to the project task. The data review tasks to be performed by field and laboratory staff are listed in the first two columns of Table D1.1. Potential errors are identified by examination of documentation and by manual examination of corollary or unreasonable data; this analysis may be computer-assisted. If a question arises or an error is identified, the manager of the task responsible for generating the data is contacted to resolve the issue. Issues which can be corrected are corrected and documented. If an issue cannot be corrected, the task manager consults with the higher-level project management to establish the appropriate course of action, or the data associated with the issue are rejected and not reported to the TCEQ for storage in SWQMIS. Field and laboratory reviews, verifications, and validations are documented.

After the field and laboratory data are reviewed, another level of review is performed once the data are combined into a data set. This review step, as specified in Table D1.1, is performed by the NRA QAO. Data review, verification, and validation tasks to be performed on the data set include, but are not limited to, the confirmation of laboratory and field data review, evaluation of field QC results, additional evaluation of anomalies and outliers, analysis of sampling and analytical gaps, and confirmation that all parameters and sampling sites are included in the QAPP.

The Data Review Checklist (see Appendix F) covers three main types of review: data format and structure, data quality review, and documentation review. The Data Review Checklist is completed and sent with the water quality data submitted to the TCEQ to ensure that the review process is being performed.

Another element of the data validation process is consideration of any findings identified during the monitoring systems audit conducted by the TCEQ CRP Lead QAS. Any issues requiring corrective action must be addressed, and the potential impact of these issues on previously collected data will be assessed. After the data are reviewed and documented, the NRA PM validates that the data meet the data quality objectives of the project and are suitable for reporting to TCEQ.

If any requirements or specifications of the CRP are not met, based on any part of the data review, the

responsible party should document the nonconforming activities and submit the information to NRA QAO with the data in the data summary (See Appendix F). All failed QC checks, missing samples, missing analytes, missing parameters, and suspect results should be discussed in the data summary.

Table D1.1: Data Review Tasks

Data to be Verified	Field Task	Laboratory Task	QA Task	Lead Organization Data Manager Task
Sample documentation complete; samples labeled, sites identified	NRA/BCRAGD Field Supervisor		NRA QAO BCRAGD QAO	
Field QC samples collected for all analytes as prescribed in the TCEQ SWQM Procedures	NRA/BCRAGD Field Supervisor		NRA, BCRAGD QAO	
Standards and reagents traceable	NRA/BCRAGD Field Supervisor	WUL, TAMU-CC PENS, SARA REL, LCRA-ELS and Energy Lab QAO	NRA, TAMU-CC PENS, BCRAGD, SARA REL, WUL, LCRA-ELS and Energy Lab QAO	
Chain of custody complete/acceptable	NRA/BCRAGD Field Supervisor	WUL, TAMU-CC PENS, SARA REL, LCRA-ELS and Energy Lab QAO	NRA, BCRAGD, SARA REL, WUL, LCRA-ELS and Energy Lab QAO	
NELAP Accreditation is current		WUL, TAMU-CC PENS, SARA REL, LCRA-ELS and Energy Lab QAO	NRA, BCRAGD, SARA REL, WUL, TAMU-CC PENS, LCRA-ELS and Energy Lab QAO	
Sample preservation and handling acceptable	NRA/BCRAGD Field Supervisor	WUL, SARA REL, TAMU-CC PENS, LCRA-ELS and Energy Lab QAO	NRA, BCRAGD, SARA REL, WUL, TAMU-CC PENS, LCRA-ELS and Energy Lab QAO	
Holding times not exceeded		WUL, SARA REL, TAMU-CC PENS, LCRA-ELS and Energy Lab QAO	NRA, BCRAGD, SARA REL, WUL, TAMU-CC PENS, LCRA-ELS and Energy Lab QAO	NRA Data Specialist
Collection, preparation, and analysis consistent with SOPs and QAPP	NRA/BCRAGD Field Supervisor	WUL, SARA REL, TAMU-CC PENS, LCRA-ELS and Energy Lab QAO	NRA, BCRAGD, SARA REL, WUL, TAMU-CC PENS, LCRA-ELS and Energy Lab QAO	
Field documentation (e.g., biological, stream habitat) complete	NRA/BCRAGD Field Supervisor		NRA QAO BCRAGD QAO	
Instrument calibration data complete	NRA/BCRAGD Field Supervisor	WUL, SARA REL, TAMU-CC PENS, LCRA-ELS and Energy Lab QAO	NRA, BCRAGD, SARA REL, WUL, TAMU-CC PENS, LCRA-ELS and Energy Lab QAO	
QC samples analyzed at required frequency	NRA/BCRAGD Field Supervisor	WUL, TAMU-CC PENS, SARA REL, LCRA-ELS and Energy Lab QAO	NRA, BCRAGD, SARA REL, WUL, TAMU-CC PENS, LCRA-ELS and Energy Lab QAO	
QC results meet performance and program specifications		WUL, SARA REL, TAMU-CC PENS, LCRA-ELS and Energy Lab QAO	NRA, BCRAGD, SARA REL, WUL, TAMU-CC PENS,	
Analytical sensitivity (LOQ/AWRL) consistent with QAPP		WUL, SARA REL, TAMU-CC PENS, LCRA-ELS and Energy Lab QAO	NRA, BCRAGD, SARA REL, WUL, TAMU-CC PENS, LCRA-ELS and Energy Lab QAO	
Results, calculations, transcriptions checked		WUL, TAMU-CC PENS, SARA REL,		

		LCRA-ELS and Energy Lab QAO		
Laboratory bench-level review performed		WUL, TAMU-CC PENS, SARA REL, LCRA-ELS and Energy Lab QAO		
All laboratory samples analyzed for all scheduled parameters		WUL, TAMU-CC PENS, SARA REL, LCRA-ELS and Energy Lab QAO	NRA QAO	
Corollary data agree			NRA QAO	
Nonconforming activities documented	NRA/BCRAGD Field Supervisor	NRA and BCRAGD PM & QAO, SARA REL Lab Supervisor, TAMU-CC PENS Lab Research Associate & QAO, WUL, LCRAELS and Energy Lab Manager	NRA, BCRAGD, SARA REL, WUL, TAMU-CC PENS, LCRA-ELS and Energy Lab QAO	
Outliers confirmed and documented; reasonableness check performed	NRA Field Supervisor		NRA QAO	
Dates formatted correctly				NRA Data Specialist
Depth reported correctly and in correct units			NRA QAO BCRAGD QAO	
TAG IDs correct				NRA Data Specialist
TCEQ Station ID number assigned				NRA Data Specialist
Valid parameter codes			NRA QAO	NRA Data Specialist
Codes for submitting entity(ies), collecting entity(ies), and monitoring type(s) used correctly			NRA QAO	
Time based on 24-hour clock			NRA QAO	NRA Data Specialist
Check for transcription errors	NRA Field Supervisor		NRA QAO	
Sampling and analytical data gaps checked (e.g., all sites for which data are reported are on the coordinated monitoring schedule)			NRA QAO	
Field instrument pre- and post-calibration check results within limits	NRA. BCRAGD		NRA QAO BCRAGD QAO	
10% of data manually reviewed		TAMU-CC PENS QAO, WUL, LCRAELS and Energy Lab Manager	NRA QAO	

D2 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 which do not meet requirements will not be submitted to SWQMIS nor will be considered appropriate for any of the uses noted in Section A4.

Appendix A: Measurement Performance Specifications (Table A6.1–A6.9)

Measurement performance specifications define the data quality needed to satisfy project objectives. To this end, measurement performance specifications are qualitative and quantitative statements that:

- clarify the intended use of the data
- define the type of data needed to support the end use
- identify the conditions under which the data should be collected

Appendix A of the QAPP addresses measurement performance specifications, including:

- analytical methodologies
- AWRLs
- limits of quantitation
- bias limits for LCSs
- precision limits for laboratory control sample duplicates (LCSDs)
- completeness goals
- qualitative statements regarding representativeness and comparability

The items identified above should be considered for each type of monitoring activity. The CRP encourages that data be collected to address multiple objectives to optimize resources; however, caution should be applied when attempting to collect data for multiple purposes because measurement performance specifications may vary according to the purpose. For example, limits of quantitation may differ for data used to assess standards attainment and for trend analysis. When planning projects, first priority will be given to the main use of the project data and the data quality needed to support that use, then secondary goals will be considered.

Procedures for laboratory analysis must be in accordance with the most recently published edition of Standard Methods for the Examination of Water and Wastewater, 40 CFR 136, or otherwise approved independently. Only data collected that have a valid TCEQ parameter code assigned in Tables A6 are stored in SWQMIS. Any parameters listed in Tables A6 that do not have a valid TCEQ parameter code assigned will not be stored in SWQMIS.

Table A6.1 Measurement Performance Specifications for NRA (WUL and PENS)

Conventional Parameters in Water

Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample (% Rec.)	Precision (RPD of LCS/LCS)	Bias (% Rec. of LCS)	Lab*
Alkalinity, Total (mg/L as $CaCO_3$)	mg/L	water	SM 2320B	00410	20	20	NA	20	NA	WUL
Residue, Total Nonfiltrable (Total Suspended Solids or TSS)	mg/L	water	SM 2540D	00530	5	2.5	NA	NA	NA	WUL
Nitrogen, **Ammonia**, Total (mg/L as N)	mg/L	water	SM 4500-NH3 D	00610	0.1	0.1	70-130	20	80-120	WUL
Nitrite Nitrogen, Total (mg/L as N)	mg/L	water	EPA 300.0	00615	0.05	0.05	70-130	20	80-120	WUL
Nitrate Nitrogen, Total (mg/L as N)	mg/L	water	EPA 300.0	00620	0.05	0.05	70-130	20	80-120	WUL
Nitrogen, Kjeldahl, Total (mg/L as N)	mg/L	water	EPA 351.4	00625	0.2	0.2	70-130	20	80-120	WUL
Phosphorus, Total, wet method (mg/L as P)	mg/L	water	EPA 365.1	00665	0.06	0.06	70-130	20	80-120	WUL
Carbon, Total Organic, NPOC (TOC) (mg/L)	mg/L	water	SM 5310 C	00680	2	0.3	NA	NA	NA	WUL
Chloride (mg/L as Cl)	mg/L	water	EPA 300.0	00940	5	0.37	70-130	20	80-120	WUL
Sulfate (mg/L as SO_4)	mg/L	water	EPA 300.0	00945	5	0.14	70-130	20	80-120	WUL
Residue, Total Filtrable (Dried at 180°C)	mg/L	water	SM 2540C	70300	10	2.5	NA	20	80-120	WUL
Chlorophyll-a, fluorometric method	µg/L	water	EPA 445.0	70953	3	2.0	NA	20	80-120	TAMU-CC PENS
Pheophytin-a, fluorometric method	µg/L	water	EPA 445.0	32213	3	2.0	NA	NA	NA	TAMU-CC PENS

References:

*WUL will be used for conventional analysis including, but not limited to, holding time constraints.

United States Environmental Protection Agency (USEPA), Clean Water Act Analytical Methods.
Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022 or applicable version.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).

Notes:

The WUL and PENS will be used for testing in situations where samples cannot be processed as usual — for example, but not limited to, when samples cannot be delivered within the required holding time.

Table A6.2 Measurement Performance Specifications for NRA (SARA REL)

Conventional Parameters in Water

Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample (% Rec.)	Precision (RPD of LCS/LCS)	Bias (% Rec. of LCS)	Lab
Alkalinity, Total (mg/L as $CaCO_3$)	mg/L	water	SM 2320B	00410	20	10.0	NA	20	NA	SARA REL
Residue, Total Nonfiltrable (Total Suspended Solids or TSS)	mg/L	water	SM 2540D	00530	5.0	1.0	NA	NA	NA	SARA REL
Nitrogen, **Ammonia**, Total (mg/L as N)	mg/L	water	SM 4500-NH3 D	00610	0.10	0.10	70-130	20	80-120	SARA REL
Nitrite Nitrogen, Total (mg/L as N)	mg/L	water	EPA 300.0	00615	0.05	0.05*	70-130	20	80-120	SARA REL
Nitrate Nitrogen, Total (mg/L as N)	mg/L	water	EPA 300.0	00620	0.05	0.05*	70-130	20	80-120	SARA REL
Nitrogen, Kjeldahl, Total (mg/L as N)	mg/L	water	EPA 351.2	00625	0.2	0.2	70-130	20	80-120	SARA REL
Phosphorus, Total, wet method (mg/L as P)	mg/L	water	EPA 365.3	00665	0.06	0.02	70-130	20	80-120	SARA REL
Carbon, Total Organic, NPOC (TOC) (mg/L)	mg/L	water	SM 5310 C	00680	2.0	1.0	NA	NA	NA	SARA REL
Chloride (mg/L as Cl)	mg/L	water	EPA 300.0	00940	5.0	5.0	70-130	20	80-120	SARA REL
Sulfate (mg/L as SO_4)	mg/L	water	EPA 300.0	00945	5.0	5.0	70-130	20	80-120	SARA REL
Residue, Total Filtrable (Total Dissolved Solids or TDS) (Dried at 180°C)	mg/L	water	SM 2540C	70300	10.0	10.0	NA	20	80-120	SARA REL
Chlorophyll-a, Spectrophotometric acid method	µg/L	water	SM 10200H	32211	3.0	1	NA	20	80-120	SARA REL
Pheophytin-a, Spectrophotometric acid method	µg/L	water	SM 10200H	32218	3.0	1	NA	NA	NA	SARA REL

References:
United States Environmental Protection Agency (USEPA), Clean Water Act Analytical Methods.
Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022 or applicable version.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).

*SARA-REL must perform a 1:10 dilution for nitrate nitrogen and nitrite nitrogen samples collected at Segment 2204 which will alter the LOQ to 0.5 mg/L.
TAMU-CC PENS will be used for coastal sites and other sites where there could be potential hold time constraint, instead of SARA REL for chlorophyll-a / pheophytin analysis only. TAMU-CC PENS is not NELAP-accredited, and therefore can only run the Chlorophyll-a / pheophytin analysis for CRP

Table A6.3 Measurement Performance Specifications for BCRAGD

Conventional Parameters in Water

Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample (% Recovery)	Precision (RPD of LCS/LCSD)	Bias (% Recovery of LCS)	Lab
Alkalinity, Total	mg/L	water	SM 2320B	00410	20	10.0	NA	20	NA	SARA REL
Residue, Total Nonfiltrable (Total Suspended Solids or TSS)	mg/L	water	SM 2540D	00530	5.0	1.0	NA	NA	NA	SARA REL
Nitrogen, **Ammonia**, Total (mg/L as N)	mg/L	water	SM 4500-NH3 D	00610	0.10	0.10	70-130	20	80-120	SARA REL
Nitrite Nitrogen, Total (mg/L as N)	mg/L	water	EPA 300.0	00615	0.05	0.05*	70-130	20	80-120	SARA REL
Nitrate Nitrogen, Total (mg/L as N)	mg/L	water	EPA 300.0	00620	0.05	0.05*	70-130	20	80-120	SARA REL
Nitrogen, Kjeldahl, Total (mg/L as N)	mg/L	water	EPA 351.2	00625	0.2	0.2	70-130	20	80-120	SARA REL
Phosphorus, Total, wet method (mg/L as P)	mg/L	water	EPA 365.3	00665	0.06	0.02	70-130	20	80-120	SARA REL
Carbon, Total Organic, NPOC (TOC) (mg/L)	mg/L	water	SM 5310 C	00680	2.0	1.0	NA	NA	NA	SARA REL
Chloride (mg/L as Cl)	mg/L	water	EPA 300.0	00940	5.0	5.0	70-130	20	80-120	SARA REL
Sulfate (mg/L as SO4)	mg/L	water	EPA 300.0	00945	5.0	5.0	70-130	20	80-120	SARA REL
Chlorophyll-a, spectrophotometric acid method	µg/L	water	SM 10200-H	32211	3.0	1	NA	20	80-120	SARA REL
Pheophytin-a, spectrophotometric acid method	µg/L	water	SM 10200-H	32218	3.0	1	NA	NA	NA	SARA REL
Residue, Total Filtrable (Total Dissolved Solids or TDS) (Dried at 180°C)	mg/L	water	SM 2540C	70300	10	10	NA	20	80-120	SARA REL
Turbidity, Lab Nephelometric Turbidity Units	NTU	water	EPA 180.1	82079	0.5	0.5	NA	NA	NA	SARA REL

References:
United States Environmental Protection Agency (USEPA), Clean Water Act Analytical Methods.
Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022 or applicable version.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
*SARA-REL must perform a 1:10 dilution for nitrate nitrogen and nitrite nitrogen samples collected at Segment 2204 which will alter the LOQ to 0.5 mg/L.

Table A6.4 Measurement Performance Specifications for NRA

Bacteriological Parameters in Water

Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample (% Recovery)	Precision (RPD) of LCS/LCSD	Bias % Recovery of LCS	Lab†
E. coli, IDEXX Colilert	MPN / 100 mL	water	SM 9223-B*	31699	1	1	NA	0.50***	NA	SARA REL, WUL
Enterococci, IDEXX Enterolert	MPN / 100 mL	water	Enterolert**	31701	10	10	NA	0.50***	NA	WUL
E. coli, IDEXX Colilert, Holding Time	hours	water	NA	31704	NA	NA	NA	NA	NA	SARA REL, WUL

* *E. coli* samples analyzed by SM 9223-B should be processed within 8 hours when possible. When transport conditions necessitate delays in delivery longer than 6 hours, the holding time may be extended and samples must be processed as soon as possible and within 30 hours.

** *Enterococcus* samples should be diluted 1:10 for all waters. Dilution is written in the Chain of Custody and verified in the lab report.

*** This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the result of a sample and the logarithm of the duplicate result. See Section B4.

†WUL will be used for *Enterococcus* analysis due to hold time constraints and will also serve as a backup laboratory for *E.coli* testing when samples cannot be delivered to the SARA REL within the 8-hour hold time.

References:

Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022 or applicable version.

Annual Book of ASTM Standards, Section 11, Water and Environmental Technology, Volume 11.02, Water.

TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).

Table A6.5 Measurement Performance Specifications for BCRAGD

Bacteriological Parameters in Water

Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	LOQ Check Sample (% Recovery)	Precision (RPD) of LCS/LCSD	Bias % Recovery of LCS	Lab
E. coli, IDEXX Colilert	MPN / 100 mL	water	SM 9223-B*	31699	1	1	NA	0.50**	NA	SARA REL
E. coli, IDEXX Colilert, Holding Time	hours	water	NA	31704	NA	NA	NA	NA	NA	SARA REL

* *E. coli* samples analyzed by SM 9223-B should be processed within 8 hours when possible. When transport conditions necessitate delays in delivery longer than 6 hours, the holding time may be extended and samples must be processed as soon as possible and within 30 hours.

** This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the result of a sample and the logarithm of the duplicate result. See Section B4.

References:

Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022 or applicable version.

Annual Book of ASTM Standards, Section 11, Water and Environmental Technology, Volume 11.02, Water.

TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).

Table A6.6 Measurement Performance Specifications for the NRA & BCRAGD

Field Parameters

Parameter	Units	Matrix	Method	Parameter Code
Temperature, Water	°C	water	SM 2550 B and TCEQ SOP V1	00010
Air Temperature	°C	air	TCEQ SOP	00020
Transparency, Secchi Disc	m	water	TCEQ SOP V1	00078
Specific Conductance, Field (µS/cm @ 25°C)	µs/cm	water	EPA 120.1 and TCEQ SOP V1	00094
Oxygen, Dissolved	mg/L	water	SM 4500-O G & TCEQ SOP V1	00300
pH (standard units)	s.u.	water	EPA 150.1 and TCEQ SOP V1	00400
Salinity (parts per thousand)	ppth	water	SM 2520 and TCEQ SOP V1	00480
Days since Last Significant Precipitation	day(s)	other	TCEQ SOP V1	72053
Depth of Bottom of Water Body	m	water	TCEQ SOP V2	82903
Reservoir Stage (ft above mean sea level)†	ft	water	TWDB	00052
Reservoir Percent Full†	% Reservoir Capacity	water	TWDB	00053
Reservoir Access Not Possible, Level too Low (Enter 1)	NS	other	TCEQ Drought Guidance	00051
Maximum Pool Width*	m	other	TCEQ SOP V2	89864
Maximum Pool Depth*	m	other	TCEQ SOP V2	89865
Pool Length*	m	other	TCEQ SOP V2	89869
% Pool Coverage in 500m reach*	%	other	TCEQ SOP V2	89870
Wind Intensity (1=Calm, 2=Slight, 3=Moderate, 4=Strong)	NU	other	NA	89965
Present Weather (1=Clear, 2=Partly Cloudy, 3=Cloudy, 4=Rain, 5=Other)	NU	other	NA	89966
Water Surface (1=Calm, 2=Ripple, 3=Wave, 4=Whitecap)	NU	water	NA	89968
Water Color (1=Brown, 2=Reddish, 3=Green, 4=Black, 5=Clear, 6=Other)	NU	water	NA	89969
Water Odor (1=Sewage, 2=Oily/Chemical, 3=Rotten Eggs, 4=Musky, 5=Fishy, 6=None, 7=Other)	NU	water	NA	89971
Tide Stage (1=Low, 2=Falling, 3=Slack, 4=Rising, 5=High)	NU	water	NA	89972
Rainfall in 1 Day	in	other	NA	82553
Rainfall in Past 7 Days	in	other	NA	82554
Turbidity (1=Low, 2=Medium, 3=High)	NU	water	NA	88842
Wind Direction (1=North, 2=South, 3=East, 4=West, 5=Northeast, 6=Southeast, 7=Northwest, 8=Southwest)	NU	other	NA	89010

* To be routinely reported when collecting data from perennial pools.
† https://waterdatafortexas.org/reservoirs/municipal/corpus-christi

References:

United States Environmental Protection Agency (USEPA), Clean Water Act Analytical Methods.
Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022 or applicable version.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 – TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

Table A6.7 Measurement Performance Specifications for NRA

24-Hour Parameters in Water

Parameter		Units	Matrix	Method	Parameter Code
Water Temperature, 24-hour	Average	°C	water	TCEQ SOP V1	00209
	Maximum				00210
	Minimum				00211
	# of Measurements	NU	water	TCEQ SOP V1	00221
Specific Conductance, 24-hour	Average	µS/cm	water	TCEQ SOP V1	00212
	Maximum				00213
	Minimum				00214
	# of Measurements	NU	water	TCEQ SOP V1	00222
pH, 24-hour	Maximum	s.u.	water	TCEQ SOP V1	00215
	Minimum				00216
	# of Measurements	NU	water	TCEQ SOP V1	00223
Salinity, 24-hour	Maximum	ppth	water	TCEQ SOP V1	00217
	Average				00218
	Minimum				00219
	# of Measurements	NU	water	TCEQ SOP V1	00220
Dissolved Oxygen, 24-hour	Minimum	mg/l	water	TCEQ SOP V1	89855
	Maximum				89856
	Average				89857
	# of Measurements	NU	water	TCEQ SOP V1	89858

References:

TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).

Table A6.8 Measurement Performance Specifications for NRA & BCRAGD

Flow Parameters

Parameter	Units	Matrix	Method	Parameter Code
Stream Flow, Instantaneous	cfs	water	TCEQ SOP V1	00061
Flow Severity (1=No Fow, 2=Low, 3=Normal, 4=Flood, 5=High, 6=Dry)	NU	water	TCEQ SOP V1	01351
Stream Flow Estimate	cfs	water	TCEQ SOP V1	74069
Flow Method (1=Gage, 2=Electric, 3=Mechanical, 4=Weir/Flume, 5=Doppler)	NU	other	TCEQ SOP V1	89835

References:

TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).

Table A6.9 Measurement Performance Specifications for NRA

Metals in Water (Dissolved)

Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
Aluminum, Dissolved	µg/L	water	EPA 200.7 Rev 4.4 (1994)	01106	200	50	70-130	20	80-120	LCRA-ELS
Arsenic, Dissolved	µg/L	water	EPA 200.8	01000	5	2	70-130	20	80-120	LCRA-ELS
Barium, Dissolved	µg/L	water	EPA 200.8	01005	1000	1	70-130	20	80-120	LCRA-ELS
Beryllium, Dissolved	µg/L	water	EPA 200.8	01010	2	1	70-130	20	80-120	LCRA-ELS
Calcium, Dissolved	mg/L	water	EPA 200.7	00915	NA	0.2	70-130	20	80-120	LCRA-ELS
Cadmium, Dissolved	µg/L	water	EPA 200.8	01025	0.1 for waters <50mg/L hardness 0.3 for waters >50mg/L hardness	0.1	70-130	20	80-120	Energy Lab
Chromium, Dissolved	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01030	10	1	70-130	20	80-120	LCRA-ELS
Cobalt, Dissolved	µg/L	water	EPA 200.8	01035	NA	1	70-130	20	80-120	LCRA-ELS
Copper, Dissolved	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01040	1 for waters <50mg/L hardness 3 for waters >50mg/L hardness	1	70-130	20	80-120	LCRA-ELS
Iron, Dissolved	µg/L	water	EPA 200.7	01046	NA	50	70-130	20	80-120	LCRA-ELS
Mercury, Dissolved	µg/L	water	EPA 245.1	71890	NA	0.2	70-130	20	80-120	LCRA-ELS
Molybdenum, Dissolved	µg/L	water	EPA 200.8	01060	NA	1	70-130	20	80-120	LCRA-ELS
Nickel, Dissolved	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01065	10	1	70-130	20	80-120	LCRA-ELS
Potassium, Dissolved	mg/L	water	EPA 200.7	00935	NA	0.2	70-130	20	80-120	LCRA-ELS
Selenium, Dissolved	µg/L	water	EPA 200.8	01145	NA	2	70-130	20	80-120	LCRA-ELS
Silver, Dissolved	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01075	0.5	0.5	70-130	20	80-120	LCRA-ELS
Sodium, Dissolved	mg/L	water	EPA 200.7	00930	NA	0.2	70-130	20	80-120	LCRA-ELS
Strontium, Dissolved	µg/L	water	EPA 200.7	01080	NA	10	70-130	20	80-120	LCRA-ELS
Thallium, Dissolved	µg/L	water	EPA 200.8	01057	1	1	70-130	20	80-120	LCRA-ELS
Titanium, Dissolved	µg/L	water	EPA 200.8	01150	NA	1	70-130	20	80-120	LCRA-ELS
Vanadium, Dissolved	µg/L	water	EPA 200.8	01085	NA	1	70-130	20	80-120	LCRA-ELS
Zinc, Dissolved	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01090	5	5	70-130	20	80-120	LCRA-ELS

Metals in Water (Total)

Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD of LCS/LCSD)	Bias %Rec. of LCS	Lab
Hardness, Total*	mg/L	water	SM 2340 B	00900	5	1.32	NA	20	80-120	LCRA-ELS
Antimony, Total	µg/L	water	EPA 200.8	01097	NA	1	70-130	20	80-120	LCRA-ELS
Barium, Total	µg/L	water	EPA 200.8	01007	NA	1	70-130	20	80-120	LCRA-ELS
Beryllium, Total	µg/L	water	EPA 200.8	01012	NA	1	70-130	20	80-120	LCRA-ELS
Calcium, Total	mg/L	water	EPA 200.7	00916	0.5	0.2	70-130	20	80-120	LCRA-ELS
Chromium, Total	µg/L	water	EPA 200.8	01034	NA	2	70-130	20	80-120	LCRA-ELS
Cobalt, Total	µg/L	water	EPA 200.8	01037	NA	1	70-130	20	80-120	LCRA-ELS
Copper, Total	µg/L	water	EPA 200.8	01042	NA	2	70-130	20	80-120	LCRA-ELS
Iron, Total	µg/L	water	EPA 200.7	01045	300	50	70-130	20	80-120	LCRA-ELS
Magnesium, Total	mg/L	water	EPA 200.7	00927	0.5	0.2	70-130	20	80-120	LCRA-ELS
Manganese, Total	µg/L	water	EPA 200.8	01055	50	1	70-130	20	80-120	LCRA-ELS
Mercury, Total, Water	µg/L	water	EPA 245.1	71960	0.006	0.006	70-130	20	80-120	Energy Lab
Molybdenum, Total	µg/L	water	EPA 200.8	01062	NA	50	70-130	20	80-120	LCRA-ELS
Nickel, Total	µg/L	water	EPA 200.8	01067	NA	2	70-130	20	80-120	LCRA-ELS
Potassium, Total	mg/L	water	EPA 200.7	00937	NA	2	70-130	20	80-120	LCRA-ELS
Selenium, Total	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01147	2	2	70-130	20	80-120	LCRA-ELS
Silver, Total	µg/L	water	EPA 200.8	01077	NA	0.5	70-130	20	80-120	LCRA-ELS
Sodium, Total	mg/L	water	EPA 200.7	00929	NA	0.2	70-130	20	80-120	LCRA-ELS
Thallium, Total	µg/L	water	EPA 200.8	01059	NA	1	70-130	20	80-120	LCRA-ELS
Tin, Total	µg/L	water	EPA 200.7	01102	NA	50	70-130	20	80-120	LCRA-ELS
Titanium, Total	µg/L	water	EPA 200.8	01152	NA	1	70-130	20	80-120	LCRA-ELS
Zinc, Total	µg/L	water	EPA 200.8	01092	NA	10	70-130	20	80-120	LCRA-ELS

*Hardness is not used for regulatory purposes but is used to assess metals in water at inland sites (estuarine sites do not require hardness analysis).

References:

United States Environmental Protection Agency (USEPA), Clean Water Act Analytical Methods.
Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022 or applicable version.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).

Appendix B: Task 3 Work Plan & Sampling Process Design and Monitoring Schedule (Plan)

Water Quality Monitoring

Objective: Water quality monitoring will focus on the characterization of a variety of locations and conditions. This will include a combination of the following:

- Planning and coordinating basin-wide monitoring.
- Routine, regularly scheduled monitoring to collect long-term information and support statewide assessment of water quality.
- Systematic, regularly scheduled short-term monitoring to screen water bodies for issues.

Task Description: The Performing Party, working closely with TCEQ, will conduct watershed monitoring to identify and evaluate surface water quality issues and to establish priorities for corrective action. Under this program, the Performing Party is responsible for the San Antonio – Nueces Costal Basin, the Nueces River Basin, the Nueces – Rio Grande Costal Basin, and the adjacent bays and estuaries.

The Performing Party will complete the following subtasks:

Monitoring Description—
In FY 2026, the Performing Party will monitor a minimum of:

- 8 bays and tidal sites for conventional, bacteria, and field parameters 4x/year
- 2 bays and tidal sites for conventional, bacteria, and field parameters 2x/year
- 2 bays and tidal sites will have metals monitoring 1x/year
- 33 river and lake sites for conventional, bacteria, flow (where applicable), and field parameters 4x/year
- 1 river site for bacteria and field parameters only
- 1 river site for field parameters only
- 2 rivers sites for Total Dissolved Solids (TDS), chlorophyll-a, bacteria and field parameters only 4x/year
- 2 rivers sites for conventional, bacteria, and field parameters 2x/year
- 5 rivers and lake sites will have metals monitoring 1x/year

In FY 2027, the Performing Party will monitor at a similar level of efforts as in FY 2026. The actual number of sites, location, frequency, and parameters collected for FY2027 will be based on priorities identified at the Basin Steering Committee and Coordinated Monitoring Meetings and include in the amended Appendix B schedule of the QAPP.

All monitoring will be completed according to the Performing Party QAPP, the *TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods* (RG-415) and the *TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data* (RG-416).

Coordinated Monitoring Meeting—The Performing Party will hold an annual coordinated monitoring meeting as described in the FY2026-2027 CRP Guidance. Qualified monitoring organizations will be invited to attend the working meeting in which monitoring needs and purposes will be discussed segment by segment and station by station. Information from participants and stakeholders will be used to select stations and parameters that will enhance overall water quality monitoring coverage, eliminate duplication of effort, and address basin

priorities. A summary of the changes to the monitoring schedule will be provided to the participants within two weeks of the meeting. Changes to the monitoring schedule will be entered into the statewide Coordinated Monitoring Schedule (CMS; cms.lcra.org) and communicated to meeting attendees. Changes to monitoring schedules that occur during the year will be entered into the CMS and communicated to meeting attendees. All requirements related to meetings will be followed and required meetings will be conducted in-person or via TCEQ approved virtual format.

Monitoring Activities—Each progress report will include a description of activities including all types of monitoring performed, number of sampling events, and the types of monitoring conducted in the quarter. The Performing Party will complete and submit a monitoring activities report as an attachment to the progress report.

Deliverables and Due Dates:

September 1, 2025 through August 31, 2026

A. Conduct water quality monitoring, submit monitoring activities report, summarize activities, and submit with progress report—September 15, October 15, November 15, and December 15, 2025; January 15, February 15, March 15, April 15, May 15, and June 15, 2026
B. Coordinated Monitoring Meeting—between March 15 and April 30, 2026
C. Coordinated Monitoring Meeting Summary of Changes—within 2 weeks following the meeting
D. Email notification that Coordinated Monitoring Schedule updates are complete—May 31, 2026

September 1, 2026 through August 31, 2027

A. Conduct water quality monitoring, submit monitoring activities report, summarize activities, and submit with progress report—September 15, October 15, November 15, and December 15, 2026; January 15, February 15, March 15, April 15, May 15, June 15, July 15, and August 15, 2027
B. Coordinated Monitoring Meeting—between March 15 and April 30, 2027
C. Coordinated Monitoring Meeting Summary of Changes—within 2 weeks following the meeting
D. Email notification that Coordinated Monitoring Schedule updates are complete—May 31, 2027

Sample Design Rationale FY 2026

The sample design is based on the legislative intent of CRP. Under the legislation, the Basin Planning Agencies have been tasked with providing data to characterize water quality conditions in support of the Texas Integrated Report of Surface Water Quality, and to identify significant long-term water quality trends. Based on Steering Committee input, achievable water quality objectives and priorities and the identification of water quality issues are used to develop work plans which are in accord with available resources. As part of the Steering Committee process, the NRA coordinates closely with the TCEQ and other participants to ensure a comprehensive water monitoring strategy within the watershed

BASIN 20

- **Segment 2001 - Mission River Tidal** – No monitoring changes.
- **Segment 2002 - Mission River Above Tidal** – No monitoring changes.
- **Segment 2003 - Aransas River Tidal** – Sam Sugarek, Center for Coastal Studies, explained that most of the bacteria is from hogs, sewer systems, and humans. Texas Water Resources Institute (TWRI) continues to monitor monthly at Stations 12947 and 12948 until July 2025.
- **Segment 2003A - Chiltipin Creek Tidal** – No monitoring changes.
- **Segment 2004 - Aransas River Above Tidal** – No monitoring changes.
- **Segment 2004A - Aransas Creek** – No changes.
- **Segment 2004B - Poesta Creek** – No changes.

BASIN 21

- **Segment 2102 - Nueces River Above Tidal** – No monitoring changes.
- **Segment 2103 - Lake Corpus Christi** – No monitoring changes.
- **Segment 2104 - Nueces River Above Frio River** – No monitoring changes.
- **Segment 2105 - Nueces River Above Holland Dam** – No monitoring changes.
- **Segment 2106 - Nueces River/Lower Frio River** – No monitoring changes.
- **Segment 2107 – Lower Atascosa River** – No monitoring changes.
- **Segment 2108 - San Miguel Creek** – No monitoring changes.
- **Segment 2109 - Leona River –** No monitoring changes.
- **Segment 2110 - Lower Sabinal River** – No monitoring changes.
- **Segment 2111 - Upper Sabinal River** – No monitoring changes.
- **Segment 2112 - Upper Nueces River –** No changes.
- **Segment 2114** – Hondo Creek – No changes.
- **Segment 2114A -Commissioner's Creek** – No monitoring changes.
- **Segment 2115 - Seco Creek** – No monitoring changes.
- **Segment 2116 - Choke Canyon Reservoir** – No monitoring changes.
- **Segment 2117 - Frio River Above Choke Canyon** – No monitoring changes.
- **Segment 2118 – Upper Atascosa River** – No monitoring changes.

BASIN 22

- **Segment 2202 - Arroyo Colorado Above Tidal** – No monitoring changes.
- **Segment 2204 - Petronila Creek above Tidal –** AU_02 boundary will be changed to start at US 77 and continue upstream. TMDL program is unaffected and basin assessor is working to change the boundary in the SWQM system. Added metals monitoring at Station 13096 in summer FY 25.

BASIN 24

- **Segment 2472 - Copano/Port/Mission Bay –** No changes.
- **Segment 2483 – Redfish Bay** – Field monitoring only.
- **Segment 2483A - Conn Brown Harbor** – No monitoring changes.

- **Segment 2485 - Oso Bay** – Station 13440 24-hour DO monitoring will be added to FY 26-27 sampling 4x/year.
  Segment 2485A - Oso Creek – No monitoring changes.
- **Segment 2491C - Hidalgo and Raymondville Drains –** No monitoring changes.
- **Segment 2492A - San Fernando Creek** –King Ranch through Harkins Engineering is sponsoring monthly monitoring of San Fernando Creek at Alice WWTP's outfall for salinity, chloride, and TDS beginning late August 2025.
- **Segment 2492B – Los Olmos Creek Tidal –** AgriLife is seeking funding to facilitate monthly nutrient monitoring at this station except for CRP monitoring months.
- **Segment 2494A - Port Isabel Fishing Harbor –** No monitoring changes.
- **Segment 2494C - San Martin Lake System –** No monitoring changes.

Site Selection Criteria

This data collection effort involves monitoring routine water quality using procedures that are consistent with the TCEQ SWQM program. Some general guidelines are followed when selecting sampling sites, as outlined below, and discussed thoroughly in SWQM Procedures, Volumes I and II. Overall consideration is given to accessibility and safety. All monitoring activities have been developed in coordination with the CRP Steering Committee and with the TCEQ. The site selection criteria specified are those the TCEQ would like considered to produce data which is complementary to that collected by the state and which may be used in assessments, etc.

1. Locate stream sites so that samples can be safely collected from the centroid of flow. Centroid is defined as the midpoint of that portion of stream width which contains 50 percent of the total flow. If multiple potential sites on a stream segment are appropriate for monitoring, choose one that would best represent the water body, and not a site that displays unusual conditions or contaminant source(s). Avoid backwater areas or eddies when selecting a stream site.
2. At a minimum for reservoirs, locate sites near the dam (reservoirs) and in the major arms. Larger reservoirs might also include stations in the middle and upper (riverine) areas. Select sites that best represent the water body by avoiding coves and back water areas. A single monitoring site is considered representative of 25 percent of the total reservoir acres, but not more than 5,120 acres.
3. Monitoring sites are selected to maximize stream coverage or basin coverage. Very long segments may require more stations. As a rule of thumb, stream segments between 25 and 50 miles long require two stations, and longer than 50 miles require three or more depending on the existence of areas with significantly different sources of contamination or potential water quality concerns. Major hydrological features, such as the confluence of a major tributary or an instream dam, may also limit the spatial extent of an assessment based on one station.
4. Because historical water quality data can be very useful in assessing use attainment or impairment, it may be best to use sites that are on current or past monitoring schedules.
5. All classified segments (including reservoirs) should have at least one Monitoring site that adequately characterizes the water body, and monitoring should be coordinated with the TCEQ or other qualified monitoring entities reporting routine data to TCEQ.
6. Monitoring sites may be selected to bracket sources of pollution, influence of tributaries, changes in land uses, and hydrological modifications.
7. Sites should be accessible. When possible, stream sites should have a USGS or IBWC stream flow gauge. If not, it should be possible to conduct flow measurements during routine visits.

Monitoring Sites for FY 2026

Table B1.1 Sample Design and Schedule, FY 2026

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	Metal Water	Conv	Bacteria	Flow	Field	Comments
Basin 20 – San Antonio – Nueces Coastal Basin													
Segment 2001 Mission River Tidal													
MISSION RIVER TIDAL NEAR SOUTH BANK IMMEDIATELY DOWNSTREAM OF THE FM 2678 BRIDGE BETWEEN REFUGIO AND BAYSIDE	12943	2001	14	NR	NR	RT			4	4		4	
Segment 2002 Mission River Above Tidal													
MISSION RIVER IMMEDIATELY UPSTREAM OF US 77 BRIDGE AT REFUGIO	12944	2002	14	NR	NR	RT			4	4	4	4	
Segment 2003 Aransas River Tidal													
ARANSAS RIVER TIDAL AT BOAT RAMP AT FM 629 TERMINUS SOUTH OF BONNIE VIEW	12947	2003	14	NR	NR	RT			4	4		4	
CHILTIPIN CREEK MID CHANNEL AT UNNAMED BRIDGE POSSIBLY AKA PLYMOUTH RD 2.11 KM DOWNSTREAM OF N END FM 631 NE OF SINTON	12930	2003A	14	NR	NR	RT		2	4	4	4	4	
Segment 2004 Aransas River Above Tidal													

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	Metal Water	Conv	Bacteria	Flow	Field	Comments
ARANSAS RIVER AT COUNTY ROAD EAST OF SKIDMORE	12952	2004	14	NR	NR	RT			4	4	4	4	
ARANSAS CREEK AT US 181 NORTH OF SKIDMORE IN BEE COUNTY	12941	2004A	14	NR	NR	RT				4	4	4	New Station for FY2020
POESTA CREEK, 77 M DOWNSTREAM OF SH 202	12937	2004B	14	NR	NR	RT			4	4	4	4	
Basin 21 – Nueces River Basin													
Segment 2102 Nueces River Below Lake Corpus Christi													
NUECES RIVER AT BLUNTZER BRIDGE ON FM 666	12964	2102	14	NR	NR	RT			4	4	4	4	
NUECES RIVER AT LA FRUTA BRIDGE ON SH 359	12965	2102	14	NR	NR	RT			4	4	4	4	Chlorophyll-a, Pheophytin & TDS only for conventionals
NUECES RIVER BELOW LAKE CORPUS CHRISTI AT HAZEL BAZEMORE PARK BOAT RAMP 4.5 KM UPSTREAM OF I-37	20936	2102	14	NR	NR	RT			4	4	4	4	
NUECES RIVER IMMEDIATELY UPSTREAM OF THE SALTWATER BARRIER DAM AT LABONTE PARK	21815	2102	14	NR	NR	RT			4	4	4	4	Chlorophyll-a, Pheophytin & TDS only for conventionals

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	Metal Water	Conv	Bacteria	Flow	Field	Comments
Segment 2103 Lake Corpus Christi													
LAKE CORPUS CHRISTI MID LAKE NEAR THE DAM 380 M NNW OF NORTHERN TIP OF DAM USGS SITE AC 280238097521301	12967	2103	14	NR	NR	RT			4	4		4	
LAKE CORPUS CHRISTI APPROX 0.2 MI OFF WESTERN SHORE DIRECTLY WEST OF HIDEAWAY HILL	17384	2103	14	NR	NR	RT			4	4		4	
NUECES RIVER AT LIVE OAK CR 151 NEAR RIVER CREEK ACRES UPSTREAM OF LAKE CORPUS CHRISTI	17648	2103	14	NR	NR	RT			4	4	4	4	
Segment 2104 Nueces River Above Frio River													
NUECES RIVER AT FM 1042 BRIDGE 1.2 MILES NORTH OF SIMMONS	12972	2104	14	NR	NR	RT		2	4	4	4	4	
NUECES RIVER AT SH 16 SOUTH OF TILDEN	12973	2104	16	NR	NR	RT			4	4	4	4	
NUECES RIVER AT FM 624	12974	2104	16	NR	NR	RT					4	4	24H DO monitoring removed for FY2020
Segment 2105 Nueces River Above Holland Dam													

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	Metal Water	Conv	Bacteria	Flow	Field	Comments
NUECES RIVER BRIDGE ON FM 190 NORTH OF ASHERTON	12976	2105	16	NR	NR	RT	4				4	4	
Segment 2106 Nueces/Lower Frio River													
FRIO RIVER AT SH 72 IN THREE RIVERS TX	12977	2106	14	NR	NR	RT			4	4	4	4	
NUECES RIVER BRIDGE ON US 281 SOUTH OF THREE RIVERS	12979	2106	14	NR	NR	RT			4	4	4	4	
Segment 2107 Atascosa River													
ATASCOSA RIVER AT FM 99 BRIDGE WEST OF WHITSETT	12980	2107	14	NR	NR	RT		2	4	4	4	4	Metals in Water added in FY2019
Segment 2108 San Miguel Creek													
SAN MIGUEL CREEK AT SH 16 NORTH OF TILDEN	12983	2108	16	NR	NR	RT		2	4	4	4	4	
Segment 2109 Leona River													
LEONA RIVER AT FM 1581 SOUTHWEST OF PEARSALL	12985	2109	13	NR	NR	RT			4	4	4	4	New for FY 2023
LEONA RIVER 370 M UPSTREAM OF FM 140	18418	2109	13	NR	NR	RT	4		4	4	4	4	
Segment 2110 Lower Sabinal River													
SABINAL RIVER BRIDGE AT US 90 WEST OF SABINAL	12993	2110	13	NR	NR	RT			4	4	4	4	
Segment 2111 Upper Sabinal River													

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	Metal Water	Conv	Bacteria	Flow	Field	Comments
SABINAL RIVER AT FM 187 5.6 MI SOUTH OF VANDERPOOL	14939	2111	13	NR	BA	RT			4	4	4	4	
SABINAL RIVER AT RANCH ROAD 187 APPROX 10 KILOMETERS SOUTH OF UTOPIA AND 400 METERS UPSTREAM OF THE CONFLUENCE WITH ONION CREEK	21948	2111	13	NR	BA	RT			4	4	4	4	
UPPER SABINAL RIVER IMMEDIATELY UPSTREAM OF FM 187 APPROXIMATELY 140 METERS NORTHEAST OF THE ENTRANCE TO LOST MAPLES STATE NATURAL AREA	22306	2111	13	NR	BA	RT			4	4	4	4	
Segment 2112 Upper Nueces River													
NUECES RIVER AT SH 55 SOUTH OF BARKSDALE	13005	2112	13	NR	NR	RT			4	4	4	4	Resumed for FY 2023
NUECES RIVER IMMEDIATELY DOWNSTREAM OF SH 55 SOUTHBOUND BRIDGE APPROXIMATELY 2.5 KM SOUTH OF LAGUNA	16704	2112	13	NR	NR	RT			4	4	4	4	

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	Metal Water	Conv	Bacteria	Flow	Field	Comments
NUECES RIVER NEAR CHALK BLUFF CAMPGROUND APPOX 14.5 MILES NORTH OF UVALDE TX OFF OF HIGHWAY 55	22330	2112	13	NR	NR	RT			2	2	2	2	new for FY 2023
NUECES RIVER NEAR CR 414 BRIDGE CROSSING APPROX 1 MILE SOUTH OF MONTELL TX	22331	2112	13	NR	NR	RT			2	2	2	2	new for FY 2023
Segment 2114 Hondo Creek													
HONDO CREEK MID CHANNEL IMMEDIATELY DOWNSTREAM OF SH 173 SOUTHEAST OF HONDO	18408	2114	13	NR	NR	RT			4	4	4	4	
COMMISSIONERS CREEK 760 METERS DOWNSTREAM OF THE IMPOUNDMENT AT CAMP OF THE OZARKS APPROXIMATELY 355 METERS SOUTH OF FM 470 NEAR THE CITY OF TARPLEY	22227	2114A	13	NR	BA	RT			4	4	4	4	
Segment 2115 Seco Creek													
SECO CREEK AT SH 470 APPROXIMATELY 10 MI WEST OF TARPLEY	13017	2115	13	NR	BA	RT			4	4	4	4	
Segment 2116 Choke Canyon Reservoir													

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	Metal Water	Conv	Bacteria	Flow	Field	Comments
CHOKE CANYON RESERVOIR NEAR THE DAM 422 M SOUTH AND 129 M EAST OF SPILLWAY CHANNEL USGS SITE AC	13019	2116	14	NR	NR	RT	4		4	4		4	
CHOKE CANYON RESERVOIR MID LAKE 15 M E OF LIVE OAK/MCMULLEN COUNTY LINE NEAR OLD HWY 99 1.25 KM NORTH OF C C STATE PARK POINT	13020	2116	14	NR	NR	RT	4		4	4		4	
CHOKE CANYON RESERVOIR APPROX 0.45 KM SOUTHEAST OF FM 99 SOUTHERN MOST BRIDGE CROSSING THE FRIO RIVER ARM	17389	2116	16	NR	NR	RT	4	2	4	4		4	Metals in Water added for FY2019
CHOKE CANYON RESERVOIR APPROX 553 METERS UPSTREAM FROM THE FRIO RIVER & SAN MIGUEL CREEK CONFLUENCE	22328	2116	16	NR	NR	RT	4		4	4		4	New for FY 2023
Segment 2117 Frio River Above Choke Canyon Reservoir													
FRIO RIVER AT SH 16 IN TILDEN	13023	2117	16	NR	NR	RT		2	4	4	4	4	
FRIO RIVER AT IH 35 NORTHBOUND BRIDGE NORTH OF DILLEY	13024	2117	13	NR	NR	RT			4	4	4	4	New for 2023

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	Metal Water	Conv	Bacteria	Flow	Field	Comments
FRIO RIVER IMMEDIATELY UPSTREAM OF SH 97 NORTH OF FOWLERTON	18373	2117	16	NR	NR	RT			4	4	4	4	
Segment 2118 Upper Atascosa River													
ATASCOSA RIVER AT FM 541 4.75 KILOMETERS UPSTREAM OF THE CONFLUENCE WITH LIVEOAK CREEK IN ATASCOSA COUNTY	20764	2118	13	NR	NR	RT	4		4	4	4	4	
Basin 22 – Nueces – Rio-Grande Coastal Basin													
Segment 2202 Arroyo Colorado Above Tidal													
ARROYO COLORADO AT US 77 IN SW HARLINGEN	13079	2202	15	NR	NR	RT			4	4	4	4	
Segment 2204 Petronila Creek Above Tidal													
PETRONILA CREEK AT FM 892 SE OF DRISCOLL	13094	2204	14	NR	NR	RT			4	4	4	4	
PETRONILA CREEK AT FM 665 EAST OF DRISCOLL	13096	2204	14	NR	NR	RT		2	4	4	4	4	Metals in Water added FY 2025
PETRONILA CREEK 181 METERS WEST AND 6 METERS SOUTH FROM THE INTERSECTION OF ALICE ROAD AND LOST CREEK ROAD	20806	2204	14	NR	NR	RT			4	4		4	

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	Metal Water	Conv	Bacteria	Flow	Field	Comments
Basin 24 – Bays and Estuaries													
Segment 2472 Copano Bay/Port Bay/Mission Bay													
PORT BAY AT MIDDLE OF SH 188 WEST OF ROCKPORT	13405	2472	14	NR	NR	RT		2	2	2		2	Metals in Water resumed in FY2023
Segment 2483 Redfish Bay													
REDFISH BAY AT SH 361 AT 3RD BRIDGE BETWEEN ARANSAS PASS AND PORT ARANSAS	13426	2483	14	NR	NR	RT						4	
CONN BROWN HARBOR MID HARBOR 50 M NORTHEAST OF THE INTERSECTION OF HUFF ST AND EAST MADDOX AVE IN ARANSAS PASS	18848	2483A	14	NR	NR	RT		2	2	2		2	Metals in Water resumed in FY2023
Segment 2485 Oso Bay													
OSO BAY IMMEDIATELY OFFSHORE AT TIP OF PENINSULA AT PADRE ISLAND DRIVE/SOUTHBOUND SH 358	13440	2485	14	NR	NR	RT	4		4	4		4	24hr DO added FY 26

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	Metal Water	Conv	Bacteria	Flow	Field	Comments
OSO BAY 40 M UPSTREAM OF OCEAN DRIVE AND APPROXIMATELY 50 M WEST OF EASTERN LANDFALL OF BRIDGE	13442	2485	14	NR	NR	RT			4	4		4	New Site for FY2020
OSO CREEK IMMEDIATELY DOWNSTREAM OF SH 286 SOUTH OF CORPUS CHRISTI	13028	2485A	14	NR	NR	RT			4	4		4	
OSO CREEK IMMEDIATELY DOWNSTREAM OF FM 763 SOUTHWEST OF CORPUS CHRISTI	13029	2485A	14	NR	NR	RT			4	4	4	4	
Segment 2491 Laguna Madre													
HIDALGO MAIN FLOODWATER CHANNEL AT FM 1420 1.65 KM SOUTH OF INTERSECTION WITH FM 490 EAST OF RAYMONDVILLE	22003	2491C	15	NR	NR	RT			4	4	4	4	New Site for FY 2018
RAYMONDVILLE DRAIN AT WILLACY COUNTY ROAD 445 800 METERS NORTH OF INTERSECTION WITH FM 3142 EAST OF RAYMONDVILLE	22004	2491C	15	NR	NR	RT			4	4	4	4	New Site for FY 2018
Segment 2492 Baffin Bay/Alazan Bay/Cayo del Grullo/Laguna Salada													

Site Description	Station ID	Waterbody ID	Region	SE	CE	MT	24 hr DO	Metal Water	Conv	Bacteria	Flow	Field	Comments
SAN FERNANDO CREEK AT US 77 AT KINGSVILLE	13033	2492A	14	NR	NR	RT			4	4	4	4	E. coli is the indicator bacteria as of FY 2018
LOS OLMOS CREEK IMMEDIATELY UPSTREAM OF US 77 SOUTH OF RIVIERA	13034	2492B	14	NR	NR	RT			4	4		4	Site added for FY2019
Segment 2494 Brownsville Ship Channel													
SAN MARTIN LAKE MID ESTUARY 2.04 KM EAST AND 0.80 KM NORTH OF THE HWY 48 BRIDGE NORTHEAST OF BROWNSVILLE	22170	2494C	15	NR	NR	RT			4	4		4	New site for FY 2020

Appendix C: Station Location Maps

Station Location Maps

Maps of stations monitored by the NRA are provided below. The maps were generated by the NRA This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. For more information concerning this map, contact Jessica Wright at (361-653-2110).

Figure C1.1 San Antonio-Nueces Coastal Basin

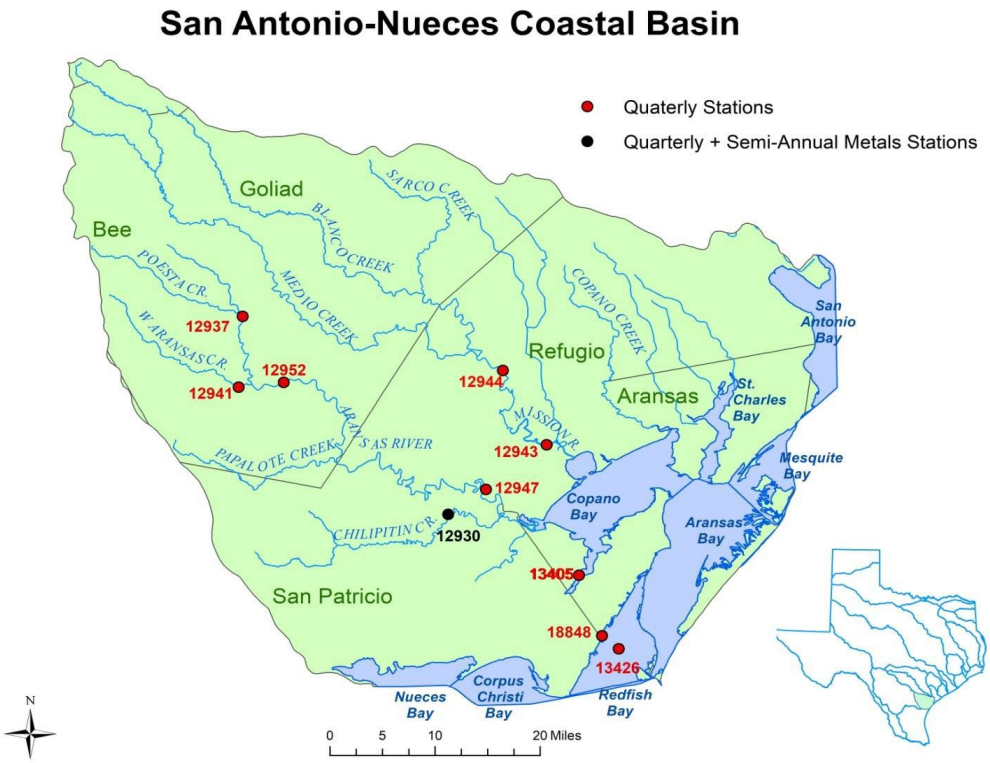


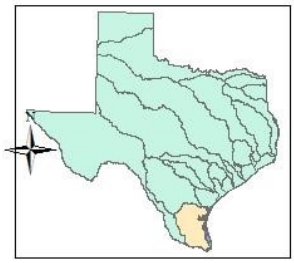
Figure C1.2 Nueces River Basin

Figure C1.3 Nueces-Rio Grande Coastal Basin

Nueces-Rio Grande Coastal Basin

Monitoring Stations

- NRA Routine Stations



Appendix D: Field Data Sheets

NRA & BCRAGD Field Sheet

Nueces River Authority
Field Data Sheet

Date: _____ Sonde S/N #: _____

Sampling Location: _____ Station ID: _____

_____

Time Collected: _____

Sample Collectors: _____

Storet Code	Value	Parameter
00020		Air Temp (°C)
00078		Secchi Disk (meters)
89969		Water Color 1=Brown 4=Black 2=Reddish 5=Clear 3=Green 6=Other
89971		Water Odor 1=Sewage 5=Fishy 2=Oily/Chemical 6=None 3=Rotten Eggs 7=Other 4=Musky
89968		Water Surface 1=Calm 3=Waves 2=Ripples 4=White Caps
89864		Maximum Pool Width (m)
89865		Maximum Pool Depth (m)
89869		Maximum Pool Length (m)
89870		% Pool Coverage in 500m
82903		Total Depth (m)

Storet Code	Value	Parameter
00061		Flow (cfs)
74069		Flow Estimate (cfs)
01351		Flow Severity 1=No flow 3=Normal 5=High 2=Low 4=Flood 6=Dry
89835 (Leave blank if 01351 is a 1 or 6)		Flow Measurement Method 1-Gage 2-Electric 3-Mechanical 4-Weir/Flume 5-Doppler
89966		Present Weather 1=Clear 3=Overcast 2=Cloudy 4=Rain
89965		Wind Intensity _____mph 1=Calm (0) 3=Moderate (8-18) 2=Slight (1-7) 4=Strong (19+)
89972		Tide Stage 1=Low 3=Slack 5=High 2=Falling 4=Rising
89010		Wind Direction 1=North 5=Northeast 2=South 6=Southeast 3=East 7=Northwest 4=West 8=Southwest
88842		Turbidity 1=Low 3=High 2=Medium
72053		Days since Last Precipitation
82553		Rainfall (Inches past 1 day)
82554		Rainfall (Inches past 7 day)

Storet	Parameter	Value	Value	Value	Value	Value	Value	Value
	Depth							
00010	Water Temp (°C)							
00400	pH							
00300	DO (mg/L)							
	DO (% Saturation)							
00094	SpC (µS/cm)							
00480	Salinity							

Comments:_____

Nueces River Authority
Field Data Sheet
Lake Profile

Date: _____ Sonde S/N #: _____

Sampling Location: _____ Station ID: _____

_____ Time In: _____

Time Collected: _____ Time Out: _____

Sample Collectors: _____

Storet Code	Value	Parameter
00020		Air Temp (°C)
00078		Secchi Disk (meters)
89969		Water Color 1=Brown 4=Black 2=Reddish 5=Clear 3=Green 6=Other
89971		Water Odor 1=Sewage 5=Fishy 2=Oily/Chemical 6=None 3=Rotten Eggs 7=Other 4=Musky
89968		Water Surface 1=Calm 3=Waves 2=Ripples 4=White Caps
00052		Reservoir Stage (Feet above mean sea level)
00053		Reservoir Percent Full (% Reservoir Capacity)

Storet Code	Value	Parameter
72053		Days since Last Precipitation
82553		Rainfall (Inches past 1 day)
82554		Rainfall (Inches past 7 day)
89966		Present Weather 1=Clear 3=Overcast 2=Cloudy 4=Rain
89965		Wind Intensity _____mph 1=Calm (0) 3=Moderate (8-18) 2=Slight (1-7) 4=Strong (19+)
89010		Wind Direction 1=North 5=Northeast 2=South 6=Southeast 3=East 7=Northwest 4=West 8=Southwest
88842		Turbidity 1=Low 3=High 2=Medium
82903		Total Depth (m)
		Picture

Storet	Parameter	Value	Value	Value	Value	Value	Value	Value
	Depth							
00010	Water Temp (°C)							
00400	pH							
00300	DO (mg/L)							
	DO (% Saturation)							
00094	SpC (Φmhos/cm)							

Storet	Parameter	Value	Value	Value	Value	Value	Value	Value
	Depth							
00010	Water Temp (°C)							
00400	pH							
00300	DO (mg/L)							
	DO (% Saturation)							
00094	SpC (Φmhos/cm)							

Comments:_____

Appendix E: Chain of Custody Forms

LCRA Environmental Laboratory Services
Request for Analysis Chain-of-Custody Record

LCRA - Environmental Lab
3505 Montopolis Dr.
Austin, TX 78744

Phone: (512) 730-6022 or 1-800-776-5272
Fax: (512) 730-6021
www.lcra.org/services/els

Project:	NRA METALS - DAY	**Client:**	NUECES RIVER AUTHORITY
Collector:		**Contact:**	JESSICA WRIGHT
Event#:		**Phone:**	214-789-6389

Report To: JESSICA WRIGHT, NUECES RIVER AUTHORITY, 500 IH 69, SUITE 805, ROBSTOWN, TX 78380

Invoice To: JESSICA WRIGHT, NUECES RIVER AUTHORITY, 500 IH 69, SUITE 805, ROBSTOWN, TX 78380

Lab ID#:

Client PO:

LAB USE ONLY	Sample ID *	Collected * Date*	Collected * Time * HH:MM	Matrix* (AQ = Aqueous, S = Solid, T = Tissue, DW = Drinking Water)	Container(s) Type/Preservative/Number * COMPOSITE Y/N	FILTERED Y/N	250PHNO3	Requested Analysis * 200.7AM	200.7AMF	200.8AM	200.8AMF	2340-HARD	245.1Hg-D	MET_FILT
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														

Transfers	Relinquished By	Date/Time	Received By	Date/Time	Cooler Temp (°C) #	T#	Obs.	Corr.
1								
2					1			
3					2			

Client Special Instructions:

Lab Use Only:

Note: Relinquishing sample(s) and signing the COC, client agrees to accept and is bound by the ELS Standard Terms and Conditions. All fields with an asterisk (*) are required to be completed.

ENERGY LABORATORIES
Trust our People. Trust our Data.

Chain of Custody & Analytical Request Record

www.energylab.com

Page _____ of _____

Account Information *(Billing Information)*

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	

Report Information *(If different than Account Information)*

Company/Name	
Contact	
Phone	
Mailing Address	
City, State, Zip	
Email	

Comments

Print

Save As...

SAN ANTONIO RIVER AUTHORITY

Regional Environmental Laboratory
CHAIN OF CUSTODY

600 E. Euclid
San Antonio, TX 78212
Phone: (210) 302-3649
FAX (210) 302-3694

Report To:		Phone #:		Collector's Name:	
Address:		FAX #:		Field Comments:	
City, State, ZIP:		E-mail:			

Rush Analysis (Additional Fees Apply) ☐3-7 days Report Delivery: ☐Mail ☐Fax ☐E-mail Method of Shipment: ☐Hand Delivered ☐Mailed ☐Ice

Sample # Lab Use Only	Sample Location	1. Collection Method	2. Sample Type	3. Matrix	4. Composite Start Date/Time	Collection Date/Time	Requested Analyses						5. Container Type	6. Type of Preservation	Container Lot Number (Microbiology Only)	Lab Use ONLY: Therm. ID: C01-_____ Receipt Temp. (°C) Observed/Corrected ____/____ pH <2 Y or N pH Paper. _____

Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:

Lab Comments: NA - Not Applicable

1. **Collection Method:** G - Grab C - Composite
2. **Sample Type:** EF – Effluent, IF – Influent, SW – Surfacewater, ST – Stormwater, GW – Groundwater, , QC – Quality Control, O – Other (Specify in Comments)
3. **Matrix:** NPW – Non-Potable Water, SE – Sediment, SO – Soil, O – Other (Specify in Comments)
4. Composite Samples require Composite Start Date/Time and Collection Date/Time
5. **Container Type:** GC – Gallon Cubitainer, QC Quart Cubitainer, AB – Amber Glass Bottle, CB – Clear Glass Bottle, PB-Plastic Bottle, AP-Amber Plastic, WP-Whirl-pak
6. **Type of Preservation:** U – Unpreserved (No Chemical Preservation), S – Sulfuric Acid, H – Hydrochloric Acid, N – Nitric Acid, P – Phosphoric Acid, O – Other (Specify in Comments)

F053_Rev12 Issued By SARA QA: JH Effective Date: 2/16/2023 Page 1 of 1

CUSTOMER RECORD & ANALYSIS

Send Results to: Jessica Wright, Nueces River Authority

Address: 500 IH69, Suite 805, Robstown, TX 78380

NUECES RIVER AUTHORITY

Lab Analysis Request

Phone:	Fax:	Project Name:	Project No.:
361-653-2110	361-653-2115	Clean Rivers Program Monitoring	CRP NRA/WUL

Sampling by:			Matrix		Preservation		Sampling		Alkalinity SM 2320 B	Chloride EPA 300.0	Sulfate EPA 300.0	TDS SM 2540 C	Nitrate EPA 300.0	Nitrite EPA 300.0		TKN EPA 351.4	Ammonia-N EPA 350.1	Phosphorus EPA 365.1		TOC SM 5310 C		TSS SM 2540 D			*E. coli* SM 9223-B	*Enterococcus* - Enterolert
Site Identification	Lab Only	No. Containers	Liquid	Conductivity	H_2SO_4	Ice	Date	Time																		

Relinquished by:	Date:	Time:	Received By:	Date:	Time:	Remarks: X = laboratory measurement
						Customer No.: 53884 **Run Lab Duplicates Separate**
						Receiving Temp (°C):

CUSTOMER RECORD & ANALYSIS

Send Results to:	Jessica Wright Nueces River Authority
Address:	500 IH69, Suite 805 Robstown, TX 78380

NUECES RIVER AUTHORITY

Lab Analysis Request

Phone:	Fax:	Project Name:	Project No.:
361-653-2110	361-653-2115	Clean Rivers Program Monitoring	NRA/CRP PENS

Sampling by:		No. Containers	Matrix		Preservation	Sampling		Chlorophyll-a EPA 445.0	Pheophytin-a EPA 445.0																				
Site Identification	Lab Only		Liquid	Conductivity	Ice	Date	Time																						

Relinquished by:	Date:	Time:	Received By:	Date:	Time:	Remarks: X = laboratory measurement

Appendix F: Data Review Checklist and Summary Shells

Data Review Checklist

This checklist is to be used by the Planning Agency and other entities handling the monitoring data in order to review data before submitting to the TCEQ. This table may not contain all of the data review tasks being conducted.

Data Format and Structure	Y, N, or N/A
Are there any duplicate Tag Id numbers in the Events file?	
Do the Tag prefixes correctly represent the entity providing the data?	
Have any Tag Id numbers been used in previous data submissions?	
Are Tag IDs associated with a valid SLOC?	
Are sampling Dates in the correct format, MM/DD/YYYY with leading zeros?	
Are sampling Times based on the 24 hr clock (e.g. 09:04) with leading zeros?	
Is the Comments field filled in where appropriate (e.g. unusual occurrence, sampling problems, unrepresentative of ambient water quality)?	
Are Submitting Entity, Collecting Entity, and Monitoring Type codes used correctly?	
Do sampling dates in the Results file match those in the Events file for each Tag Id?	
Are values represented by a valid parameter code with the correct units?	
Are there any duplicate parameter codes for the same Tag Id?	
Are there any invalid symbols in the Greater Than/Less Than (GT/LT) field?	
Are there any Tag Ids in the Results file that are not in the Events file or vice versa?	
Data Quality Review	Y, N, or N/A
Are “less-than” values reported at the LOQ? If no, explain in Data Summary.	
Have the outliers been verified and a "1" placed in the Verify_flg field?	
Have checks on correctness of analysis or data reasonableness been performed? e.g., Is ortho-phosphorus less than total phosphorus? Are dissolved metal concentrations less than or equal to total metals? Is the minimum 24 hour DO less than the maximum 24 hour DO? Do the values appear to be consistent with what is expected for site?	
Have at least 10% of the data in the data set been reviewed against the field and laboratory data sheets?	
Are all parameter codes in the data set listed in the QAPP?	
Are all stations in the data set listed in the QAPP?	
Documentation Review	Y, N, or N/A
Are blank results acceptable as specified in the QAPP?	
Were control charts used to determine the acceptability of lab duplicates (if applicable)?	
Was documentation of any unusual occurrences that may affect water quality included in the Event file’s Comments field?	
Were there any failures in sampling methods and/or deviations from sample design requirements that resulted in unreportable data? If yes, explain in Data Summary.	
Were there any failures in field and/or laboratory measurement systems that were not resolvable and resulted in unreportable data? If yes, explain in Data Summary.	
Was the laboratory’s NELAP Accreditation current for analysis conducted?	
Did participants follow the requirements of this QAPP in the collection, analysis, and reporting of data?	

Data Summary

Data Set Information

Data Summary

Data Set Information

Data source: **Field data sheets and lab analysis reports**

Lab ID Range:

Date Range:

Comments:

Please explain in the space below any data discrepancies discovered during data review including:

- Inconsistencies with AWRL specifications or LOQs

- Failures in sampling methods and/or laboratory procedures that resulted in data that could not be reported to the TCEQ (indicate items for which the Corrective Action Process has been initiated).

- Include completed Corrective Action Plans with the applicable Progress Report.

Dry/Inaccessible sites:

Rejected Data:

Flagged Data/Analysis Comments:

I certify that all data in this data set meets the requirements specified in Texas Water Code Chapter 5, Subchapter R (TWC §5.801 et seq) and Title 30 Texas Administrative Code Chapter 25, Subchapters A & B.

✓ This data set has been reviewed using the Data Review Checklist.

Planning Agency Data Manager:

Date:

NRA's Data Checklist

Clean Rivers Program
SWQMIS Data Checklist

The Surface Water Quality Management Information System (SWQMIS) data checklist shall be performed by NRA Quality Assurance Officer (QAO) and Project Manager (PM), tasked with entering data into the SWIQMIS for the Clean Rivers Program and similar projects. This process involves verifying that all data has been properly reviewed and validated before it is uploaded into the SWQMIS. Also, a corresponding data summary and data review checklist is sent to the Texas Commission on Environmental Quality (TCEQ) PM.

Project: _____ Data Set Name: _____ TCEQ PM: _____ TCEQ Data Manager: _____

QAO Initials		Date	PM Initials
_____	Ensure that all stations mentioned in the dataset are accurately listed in the QAPP.	_____	_____
_____	All parameter codes are listed in the QAPP.	_____	_____
_____	Confirm that the sonde, used for data collection, has passed both post- and pre-calibrations for all accepted data points to maintain data integrity.	_____	_____
_____	Review and address all flags associated with sample analysis results, ensuring they are thoroughly identified and documented in the data summary.	_____	_____
_____	Confirm that all data is in the correct format (e.g., units, significant figures) as specified in the project's QAPP.	_____	_____

PM Initials

_____ At least 10% of the data in the set has been reviewed against the Field and Laboratory data sheets _____

By signing this checklist, NRA acknowledges that the QAO has sufficiently fulfilled the data requirements associated with the Clean Rivers Program and NRA PM can upload acceptable data into the SWQMIS test-page.

NRA QAO Name: _____ Date: _____

NRA PM Name: _____ Date: _____

Effective April 2024

Attachment 1 NRA's Clean Rivers Program Special Training

Clean Rivers Program
Special Training Requirements

Specialized training shall be performed by new NRA employees tasked with participating in the Clean Rivers Program and similar projects. Training must be implemented prior to participation, and may include one or more of the following categories:

- Instrument Calibration & Maintenance
- Instantaneous Water Quality Parameters
- Sample Collection & Handling
- Field Measurements
- FlowTracker Operations
- Instrument Calibration & Maintenance
- QAPP and amendments
- CAP process

All training events shall be conducted by NRA's Field Supervisor in the field and/or laboratory setting, as appropriate.

Employee Initials		Date	Field Supervisor Initials
_____	can adequately perform instrument calibration and maintenance according to established procedures and can accurately perform calculations associated with calibration control limits.	_____	_____
_____	understands instantaneous water quality parameters associated with the sonde instrument probes to collect and record data according to established procedures.	_____	_____
_____	has read the approved sample collection and handling procedures including metals and can locate and assemble the necessary equipment to collect and transport samples properly.	_____	_____
_____	is familiar with all field measurement protocols including riverine, reservoir, and biological sampling methods in accordance with established procedures.	_____	_____
_____	is familiar with the FlowTracker and has performed stream discharge measurements in accordance with established procedures and can record parameters successfully.	_____	_____
_____	has been provided and/or issued appropriate safety PPE: Nitrile gloves, hip boots/ waders, PFD.	_____	_____
_____	is familiar with the QAPP and its associated amendments and attachments	_____	_____
_____	is familiar with the CAP process	_____	_____

By signing this checklist, NRA acknowledges that the staff member has sufficiently fulfilled the training requirements associated with the Clean Rivers Program and is now capable in conducting and/or assisting with the collection of water quality samples, field parameters, discharge measurements, and instrument calibrations.

Employee Name: _____ Date: _____

Supervisor Name: _____ Date: _____

Effective April 2024

Attachment 2 BCRAGD's Clean Rivers Program Special Training

Clean Rivers Program
Special Training Requirements

Specialized training shall be performed by new BCRAGD employees tasked with participating in the Clean Rivers Program and similar projects. Training must be implemented prior to participation, and may include one or more of the following categories:

- Instrument Calibration & Maintenance
- Instantaneous Water Quality Parameters
- Sample Collection & Handling
- Field Measurements
- FlowTracker Operations

All training events shall be conducted by BCRAGD's Field Supervisor in the field and/or laboratory setting, as appropriate.

Employee Initials	Date	Field Supervisor Initials
_____can adequately perform instrument calibration and maintenance according to established procedures and can accurately perform calculations associated with calibration control limits.	_____	_____
_____understands instantaneous water quality parameters associated with the sonde instrument probes to collect and record data according to established procedures.	_____	_____
_____has read the approved sample collection and handling procedures and can locate and assemble the necessary equipment to collect and transport samples properly.	_____	_____
_____is familiar with all field measurement protocols including riverine, reservoir, and biological sampling methods in accordance with established procedures.	_____	_____
_____is familiar with the FlowTracker and has performed stream discharge measurements in accordance with established procedures and can record parameters successfully.	_____	_____
_____has been provided and/or issued appropriate safety PPE: Latex gloves, protective eyewear, hip boots/waders, PFD.	_____	_____

By signing this checklist, BCRAGD acknowledges that the staff member has sufficiently fulfilled the training requirements associated with the Clean Rivers Program and is now capable in conducting and/or assisting with the collection of water quality samples, field parameters, discharge measurements, and instrument calibrations.

Employee Name: _____ Date: _____

Supervisor Name: _____ Date: _____

Effective January 2024