Northeast Texas Municipal Water District
FY 2026–2027 Clean Rivers Program Quality Assurance Project Plan

PO Box 955
Hughes Springs, Texas 75656

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

7/30/2025
Jason Godeaux, Manager Date
Water Quality Monitoring and Assessment Section

7/30/2025
Sarah Whitley, Team Leader Date
Water Quality Standards and Clean Rivers Program

7/30/2025
Sunshyne Hendrix Date
Project Quality Assurance Specialist
Clean Rivers Program

7/30/2025
Jenna Wadman, Project Manager Date
Clean Rivers Program

07/30/2025
Cathy Anderson, Team Leader Date
Data Management and Analysis

Air Monitoring Division

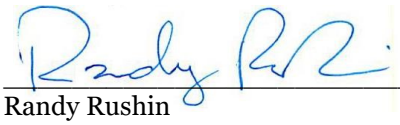
07/30/2025
D. Jody Koehler, Date
TCEQ Quality Assurance Manager
Laboratory and Quality Assurance Section

7/30/2025
Loren Walker, Date
Lead CRP Quality Assurance Specialist
Quality Assurance Team

Northeast Texas Municipal Water District (NETMWD)

Osiris Brantley NETMWD General Manager	Date	Robert Speight NETMWD Project Manager	Date

Water Monitoring Solutions, Inc. (WMS)



7/24/2025

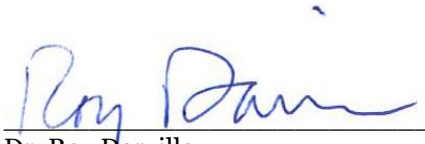
Randy Rushin — Date
WMS Project Manager

7/23/2025

Ryan Seymour — Date
WMS Data Manager

7/21/2025

Angela Kilpatrick — Date
WMS Quality Assurance Officer



7/18/2025

Dr. Roy Darville — Date
WMS Data Collection Supervisor

Lower Colorado River Authority Environmental Services Laboratory (LCRA ELS)

Dale Jurecka 7/21/25

Dale Jurecka Date
LCRA ELS Laboratory Manager

Jason Woods 7/30/2025

Jason Woods Date
LCRA ELS Project Manager

07/21/2025

Angel Mata Date
LCRA ELS Quality Manager

A3 Table of Contents

List of Acronyms

AWRL	Ambient Water Reporting Limit
BMP	Best Management Practices
CAP	Corrective Action Plan
CE	Collecting Entity
CFR	Code of Federal Regulations
COC	Chain of Custody
CRP	Clean Rivers Program
DCS	Data Collection Supervisor
DO	Dissolved Oxygen
DM	Data Manager
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
IBWC	International Boundary and Water Commission
LCRA ELS	Lower Colorado River Authority - Environmental Laboratory Services
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
NETMWD	Northeast Texas Municipal Water District
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
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
TMDL	Total Maximum Daily Load
TNI	The NELAC Institute
TSWQS	Texas Surface Water Quality Standards
TWDB	Texas Water Development Board
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
WMS	Water Monitoring Solutions, Inc.
WQS	Water Quality Standards

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 Northeast Texas Municipal Water District (NETMWD) 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 NETMWD 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, 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*.

The Cypress Creek Basin in Texas consists of three major watersheds converging at the lowermost segment of Big Cypress Creek (Segment 0402). The four largest reservoirs in the basin are Caddo Lake (Segment 0401), Lake O' the Pines (Segment 0403), Lake Bob Sandlin (Segment 0408), and Lake Cypress Springs (Segment 0405). These four reservoirs are impoundments of Big Cypress Creek and are designated for use as public water supplies. Four smaller reservoirs (Monticello, Welch, Ellison Creek, and Johnson Creek) have been constructed on tributary streams to be used primarily as cooling ponds for steam-electric power plants. While shoreline development has been permitted only around Lake Cypress Springs, recreational and retirement housing construction continues within the small watersheds draining directly into Lake Bob Sandlin, Lake O' the Pines, and Caddo Lake.

The Cypress Creek Basin water quality monitoring program has been established to collect surface water samples within the basin and to provide longitudinal water quality data for continuing evaluation of water quality. Previous efforts of other monitoring agencies have established reliable and useful data for evaluation under the Surface Water Quality Monitoring (SWQM) water quality assessment procedures. Monitoring data has been collected at gage locations within each of the ten segments of the Cypress Creek Basin.

This Cypress Creek Basin water quality monitoring plan was developed to maintain consistent sampling through time and locations, provide data analyzed using consistent detection limits, and address water quality impairments and concerns throughout the basin. Low dissolved oxygen (DO) concentrations occur in stream and marginal reservoir habitats throughout the Cypress Creek Basin. All segments except 0408 (Lake Bob Sandlin) have reaches or associated unclassified water bodies with impairments or concerns for low DO concentrations in the *2024 Texas Integrated Report for Clean Water Act Sections 305(b) and 303(d) (IR)*. In most locations, the low DO concentrations are associated with natural low flow conditions and high levels of photosynthesis and respiration.

Marginal and backwater habitats in Caddo Lake (0401) occasionally exhibit DO concentrations below the segment criterion for support of aquatic life. However, these episodes are not generally accompanied by large daily changes in DO concentrations, and often reflect relatively constant, low concentrations throughout a 24-hour sample period. Caddo Lake has a lower nutrient load than Lake O' the Pines, and consequently does not support intense algal production during summer conditions. Swamp-like conditions and thick invasive plant cover limits the amount of light penetrance which most likely causes low DO in the upper portions of the lake. Low DO is uncommon at the open water station, 10283 (mid lake). The *2024 Texas IR* also includes an

assessment of the DO levels in Caddo Lake which supported a pattern of lower DO in the upper end of the lake. Assessment units in segments 0404, 0406, 0407, 0409 and 0410 have concerns or impairments for bacteria levels. In 2011, data collection was completed for a collaborative effort to assess sources for the listings in 0404 (Big Cypress Creek), 0404B (Tankersley Creek), and 0404C (Hart Creek). This approach to assessing bacteria loading is one option to consider in the other listed watersheds in the basin. A similar bacteria study was conducted in South Lilly Creek in 2016.

Except for nitrate, nutrient concentrations in streams rarely exceed TCEQ screening levels. However, total phosphorus and total nitrogen concentrations in streams throughout the Cypress Creek Basin are usually at levels that can result in excessive algal growth under low flow conditions or in impoundments. The heaviest loads have been observed originating from the Tankersley Creek watershed, and to a lesser extent, from other tributary watersheds in the upper part of the basin. Some phosphorus and a large proportion of the nitrogen load is lost during transport in Big Cypress Creek from the vicinity of Mount Pleasant and Pittsburg to the headwaters of Lake O' the Pines, presumably through biological activity and trapping in the floodplain.

Low pH values, toxicity in water and sediments, and mercury in fish tissues appear to be phenomena associated with the lower portion of the Cypress Creek Basin. The lower basin coincides with predominantly acidic soils and forested watersheds that result in "soft", acidic waters of relatively low buffering capacity. Those conditions, coupled with the intense biological activity associated with a warm, shallow, eutrophic environment are thought to be conducive to the mobilization of heavy metals, such as mercury, into aquatic food chains.

Despite the widespread occurrence of low DO concentrations, elevated nutrient and bacteria levels, and concerns for macrobenthic communities and habitat, fish communities in streams throughout the Cypress Creek Basin continue to exhibit the abundance, trophic structure (the mixture of herbivores, detritivores and predators), and diversity appropriate to, or better than, that expected based on the quality of the habitat at those locations. To the extent that low DO concentrations are associated with low flow conditions, it is likely that aquatic communities in the Cypress Creek Basin are, to some extent, adapted to tolerate conditions that occur at least occasionally during summer conditions even in minimally disturbed streams.

The primary goal of the Cypress Creek Basin Clean Rivers Program is to provide the appropriate, quality assured data to allow continuing assessment and management of water quality in the Cypress Creek Basin. Objectives of this monitoring program include local participation in the collection and submittal of quality-assured data to provide the TCEQ with reliable information concerning water quality conditions within the basin. Assessment of accurate information provides valuable insight into the nature and source of water quality problems and successes. These assessments, along with sound decisions based on the Texas Surface Water Quality Standards (TSWQS), help in the evaluation of permit requirements with respect to water quality conditions and trends to specific water bodies in the basin. These evaluations, in addition to historical data, are used to support the development of cost-effective water quality management programs.

To achieve this goal, a variety of sampling regimens have been implemented including routine water quality grab sampling, diel dissolved oxygen monitoring, and biological and habitat assessments. Routine water quality grab sampling has been an ongoing effort over the years. However, this type of sampling provides only a short-term view of water quality in an area, especially for streams and rivers where flow conditions and water quality can change rapidly. Due to the dynamic nature of these systems, specific acute water quality issues may be missed due to sample timing. For example, stormwater runoff may not be captured by routinely scheduled quarterly grab sampling. Biological monitoring provides a more long-term view of water quality in these systems. Biological monitoring consists of fish and benthic macroinvertebrates which are identified and evaluated to determine if the assigned aquatic life use is being met. Since biological populations respond predictably to water quality issues, issues that may not be captured in a water quality grab sample may be identified. For example, in a system that frequently receives discharges of poor water quality, the species present will typically be more tolerant of poor water quality. However, in a system that does not receive such discharges, the biological community may contain a higher number of intolerant species to poor water quality and therefore may indicate that the system generally maintains good water quality. As a result, biological monitoring can be used to determine the level of aquatic life use the system can sustain as well as the associated standards that are appropriate for the system.

A5 Project/Task Description

Assessment and management of water quality within the Cypress Creek Basin is dependent on quality-assured

data. Water quality monitoring and data collection is a primary function of the Clean Rivers Program. Water quality monitoring in the Cypress Creek Basin is made possible through a cooperative program directed by NETMWD. WMS assists NETMWD in planning, data collection, analysis, and reporting of water quality data. The Clean Rivers Program Steering Committee members, basin partners and affiliates include Pilgrim's Pride Corporation, Franklin County Water District, Titus County Fresh Water District #1, US Steel Tubular Products, Luminant, and the U.S. Geological Survey (USGS).

The monitoring program for the Cypress Creek Basin Clean Rivers Program is divided into two major areas: (1) water quality monitoring via routine (RT) station monitoring and (2) monitoring that is biased to season (BS).

Routine (RT) monitoring of physical, chemical, and bacteriological parameters is used to populate SWQMIS with data for the assessment of the water bodies in the Cypress Creek Basin. A major objective of this monitoring type is to identify trends and water quality changes in the major sub-basins. Reservoir monitoring usually occurs near the dam and in the major arms that receive contributory surface inflow from rivers and streams. Routine sampling is generally conducted on a quarterly basis to provide information on water quality conditions. For FY 2026, routine sampling will continue without the intentional examination of any particular target environmental condition or event at twelve stations.

Biased-to-season (BS) monitoring is accomplished by collecting DO, pH, conductance, and temperature values over a period of twenty-four hours (diel). Diel monitoring will be performed at two stations four times per year in FY 2026. To ensure unbiased, seasonally representative data, diel monitoring is allocated to various times of the year over a period of at least two years as described in the Interim Change Document #02_2015_V1 of TCEQ RG-415, *Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, Chapter 3*.

Biased-to-season monitoring also includes performing biological collections and habitat assessment. Biological sampling provides a long-term view of stream health due to the extended life cycle of organisms. Biological monitoring and habitat assessment will be conducted by following the procedures published in *Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data*. Sampling for nekton and benthic macroinvertebrates, diel monitoring, and a habitat assessment will be conducted at one station in Harrison Bayou (Segment 0401A) during the index and critical periods of FY 2026.

The project design and site selection was chosen by the Coordinated Monitoring Committee with the intention of focusing attention on specific watersheds and water bodies known or suspected to have water quality issues, based either upon local public concern or assessment unit information contained in the *2024 Texas IR*.

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 WMS and NETMWD Project Managers (PMs) to the TCEQ CRP PM electronically. WMS 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 WMS and NETMWD PMs, the WMS 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 WMS and NETMWD PMs. If adherence letters are required, WMS 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 WMS and NETMWD 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 NETMWD, the TCEQ CRP PM, and TCEQ technical staff. Appendices will be written in an abbreviated format and will reference the NETMWD QAPP where appropriate. Appendices will be approved by the NETMWD PM, the WMS PM, the WMS QAO, the LCRA ELS (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 NETMWD to project participants before data collection activities commence. The NETMWD 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 NETMWD 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.

Aquatic Life Monitoring and diel monitoring will be conducted at locations identified in Appendix B. These sampling regimes are considered biased to season. Additional parameters associated with Aquatic Life Monitoring will be included in the final data set but are not listed in Tables A6.7 to A6.9, specifically those for the reporting of taxa inventory.

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 NETMWD 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.

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 NETMWD. The NETMWD 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 NETMWD 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.

Jenna Wadman
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 NETMWD audits. Verifies QAPPs are being followed by contractors and that projects are producing data of known quality. Coordinates project planning with the NETMWD 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.

Northeast Texas Municipal Water District

Osiris Brantley
Northeast Texas Municipal Water District General Manager
General Manager of NETMWD. Participates as a member of the Steering Committee for the Cypress Creek Basin Clean Rivers Program and provides coordination and cooperation between the project partners, stakeholders, and WMS.

Robert Speight
Northeast Texas Municipal Water District 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. Conducts monitoring systems audits of WMS to ensure QAPPs are followed by the Cypress Creek basin planning agency participants and that projects are producing data of known quality. Ensures that sub-participants 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. Provides oversight that data are acceptable for reporting to the TCEQ. Maintains access to quality-assured data on the TCEQ site via link from the NETMWD internet site.

Water Monitoring Solutions, Inc.

WMS contracts with the Northeast Texas Municipal Water District to administer the tasks and responsibilities outlined in this QAPP on behalf of the NETMWD.

Randy Rushin
WMS Project Manager

Responsible for contact and coordination with NETMWD, TCEQ and other entities participating in the Cypress Creek Basin Clean Rivers Program activities. Responsible for reviewing and maintaining the QAPP and monitoring its implementation. Responsible for implementing and monitoring CRP requirements in contracts, QAPPs, and QAPP amendments and appendices and maintaining records of sub-tier commitment to requirements specified in this QAPP. Responsible for the supervision of all CRP field activities (water quality, biological sampling and monitoring), including equipment calibration, sampling, sample preservation, fieldwork, sample transport, and Chain of Custody (COC) maintenance in compliance with the approved QAPP. Designates WMS staff with subordinate responsibility and oversees task progress and completion of project deliverables. Responsible for performing necessary data analysis and development of conclusions and recommendations in technical deliverables. Notifies the NETMWD PM and TCEQ CRP PM of circumstances which may adversely affect the quality of data. Responsible for maintaining records of QAPP distribution, including appendices and amendments. Ensures that field staff are properly trained and that training records are maintained.

Angela Kilpatrick
WMS Quality Assurance Officer

Responsible for coordinating the implementation of the QA program. Coordinates the research and review of technical QA material and data related to water quality monitoring system design and analytical techniques. Responsible for receiving and reviewing project QA records. Responsible for coordinating with the TCEQ CRP PM to resolve QA-related issues. Coordinates and monitors deficiencies, non-conformances and corrective actions. Coordinates and reviews records of data verification and validation.

Ryan Seymour
WMS Data Manager

Responsible for the transfer of basin quality-assured water quality data in a format compatible with SWQMIS. Assists WMS QAO with identifying, receiving, and reviewing project QA records. Notifies the WMS PM of particular circumstances which may adversely affect the quality of data. Assists WMS QAO with deficiencies, non-conformances and corrective actions. Coordinates and reviews records of data verification and validation. Reviews data from monitoring events and provides data quality comments to the WMS PM. Responsible for ensuring that field and lab data are properly reviewed and verified.

Dr. Roy Darville
Data Collection Supervisor

Ensures that all field sampling activities are conducted in accordance with this QAPP, reporting to the WMS PM and QAO any deviation from this QAPP. Maintains proper documentation of sampling events, sampling preservation, sampling shipment, and field procedures at designated stations. Responsible for the supervision of all field activities including water quality sampling and monitoring, and including equipment preparation, sampling, sample preservation, fieldwork, sample transport, and COC maintenance in compliance with the approved QAPP. Participates in field data collection activities and training of new field personnel.

Lower Colorado River Authority Environmental Laboratory Services (LCRA ELS)

Jason Woods
Laboratory Project Manager

Responsible for analyses performed by LCRA ELS. Responsible for project set up in LIMS. Serves as the primary point of contact for all laboratory activity conducted by LCRA under this QAPP.

Dale Jurecka
Laboratory Manager
Responsible for the overall performance, administration, and reporting of analyses performed by LCRA ELS. Responsible for ensuring that laboratory personnel involved in generating analytical data have adequate training and a thorough knowledge of the QAPP and all SOPs specific to the analysis or task performed and or supervised. Responsible for oversight of all operations, ensuring that all QA/QC requirements are met, and documentation related to the analysis is completely and accurately reported.

Angel Mata
Quality Manager
Responsible for the overall quality control and quality assurance of analyses performed by LCRA's ELS. Monitors the implementation of the QM/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.

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.

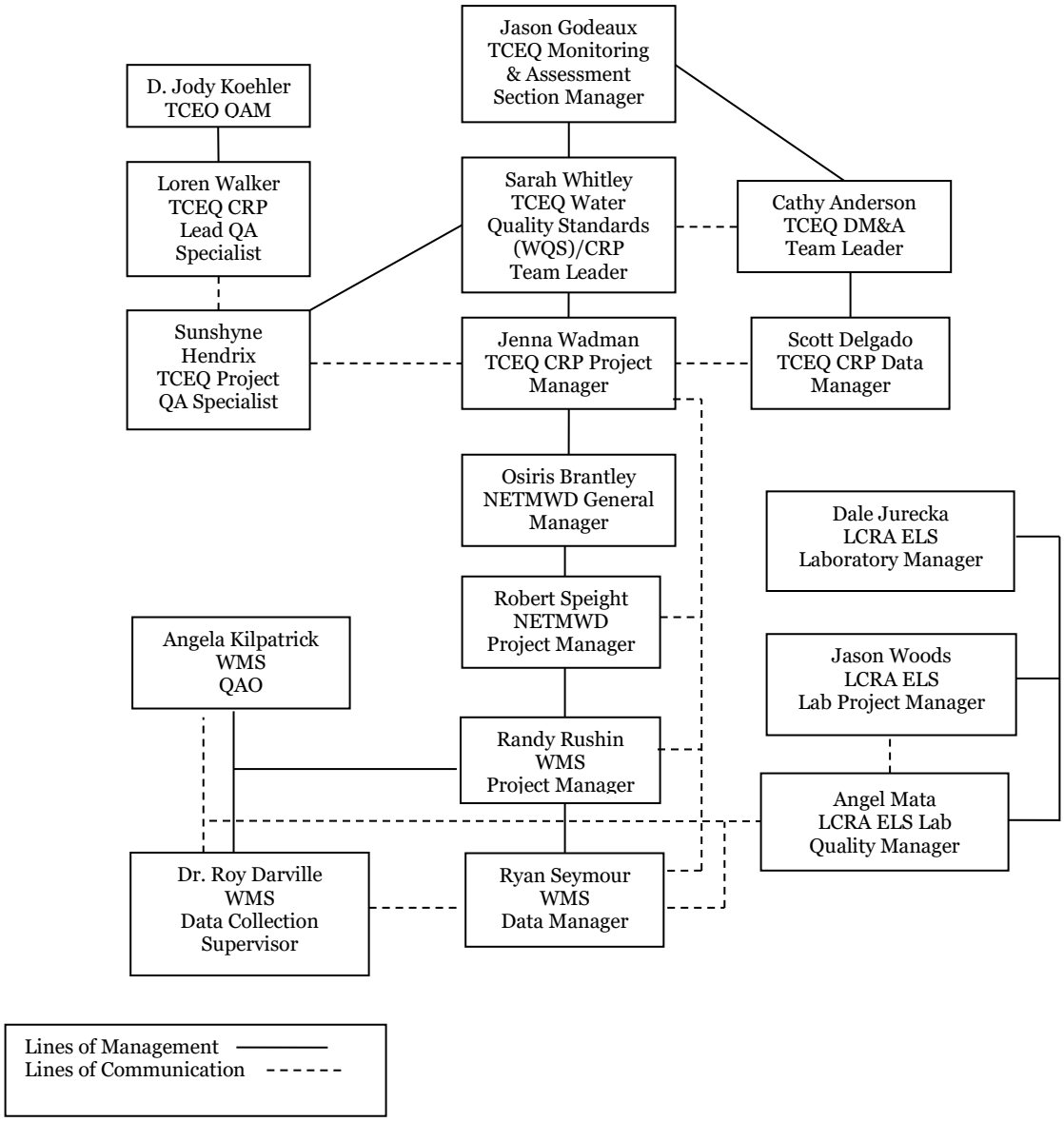
The TCEQ QA Manager (QAM) and designated TCEQ QA staff from the Laboratory and Quality Assurance Section within the Air Monitoring Division of the Office of Air are independent of activities performed by CRP. No CRP staff have authority to sign QAPPs, amendments, or appendices on behalf of TCEQ's QAM 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, the WMS PM and/or WMS Data Collection Supervisor (DCS) trains them in proper instrument calibration, field sampling techniques, and field analysis procedures. The WMS QAO (or designee) will document the successful field demonstration. The WMS 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.

Collection of habitat, benthics, and fish will be in accordance with the *Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, Revised May 2014* (or most recent version). Individuals conducting identification of benthic macroinvertebrates and fish have adequate training and education to accurately identify species.

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	NETMWD, WMS	5	Electronic
Field SOPs	NETMWD, WMS	5	Electronic
Laboratory quality manuals	LCRA ELS*	5	Electronic
Laboratory SOPs	LCRA ELS*	5	Electronic
QAPP distribution documentation	NETMWD, WMS	5	Electronic
Field staff training records	WMS	5	Electronic
Field equipment calibration/maintenance logs	NETMWD, WMS**	5	Electronic, Paper
Field instrument printouts	WMS	5	Electronic
Field notebooks or data sheets	NETMWD, WMS**	5	Electronic, Paper
Chain of custody records	LCRA ELS*, NETMWD, WMS	5	Electronic
Laboratory calibration records	LCRA ELS*	5	Electronic
Laboratory instrument printouts	LCRA ELS*	5	Electronic
Laboratory data reports/results	LCRA ELS*, NETMWD, WMS	5	Electronic
Laboratory equipment maintenance logs	LCRA ELS*	5	Electronic
Corrective action documentation	NETMWD, WMS, LCRA ELS*	5	Electronic

* Laboratory Records must be retained in accordance with the NELAC Standards

**WMS will transfer all paper documents to NETMWD annually and will retain electronic copies only.

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.

Test reports include the following:

- Title of report
- Name and address of the laboratory

- Name and address of the client
- A clear identification of the sample(s) analyzed
- Station, date and time of sample collection/receipt
- Identification of method used
- Identification of samples that did not meet QA requirements and why (e.g., holding times exceeded)
- Sample results
- Units of measurement
- Sample matrix
- Dry weight or wet weight (as applicable)
- Sample depth
- Name and title of person authorizing 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.
- Holding time for *E. coli*.
- 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)
    - Additionally, laboratory control spikes/laboratory control spike duplicates may also be listed under other nomenclature such as laboratory fortified blanks and laboratory fortified blank duplicates depending on the standard report generated by the lab.
- Certification of NELAP compliance

The information in test reports will be consistent with the information that is needed to prepare data submittals to TCEQ. Otherwise, reports will be consistent with the TNI Standards and will include any additional information critical to the review, verification, validation, and interpretation of data.

Electronic Data

After field sampling is completed, data sheets and applicable QA documentation such as calibration logs are scanned into a portable document format (pdf) file and electronically transmitted to the WMS PM. Laboratory reports, scanned COC forms, and results are sent electronically by the LCRA ELS Project Manager to the NETMWD and WMS PMs.

The WMS PM compiles and electronically distributes data files to the WMS QAO and WMS Data Manager (DM) as they are received. After the data have been verified, validated, and formatted, the WMS DM electronically transfers the files to the WMS PM and NETWMD PM for review. Upon approval, the WMS DM submits the data files to the TCEQ CRP PM.

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.

B1 Sampling Process Design

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 NETMWD'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	Minimum Sample Volume	Holding Time	Matrix	Container	Preservation +
*E. coli**	125 mL	8 hours	Water	Sterile Plastic	Place in ice to cool to <6 °C with sodium thiosulfate powder
Alkalinity	100 ml	14 days	Water	Plastic	Place in ice to cool to <6 °C but not frozen
Chloride	100 ml	28 days			
Nitrate (N)	150 ml	48 hours			
Nitrite (N)	150 ml	48 hours			
Sulfate	100 ml	28 days			
Total Suspended Solids	400 ml	7 days			
Chlorophyll *a*/ Pheophytin	250 ml	Filter <48 hours and as soon as possible after sample collection; Frozen filters may be stored up to 24 days	Water	Amber Plastic	Dark and in ice, cool to <6 °C but not frozen prior to filtration
Ammonia	150 ml	28 days	Water	Plastic	1-2 ml H_2SO_4 to pH <2 and cool to <6 °C but not frozen
Total Kjeldahl Nitrogen	200 ml	28 days			
Total Phosphorus	150 ml	28 days			
Total Organic Carbon	200 ml	28 days			
Fish Vouchers	As needed to submerge samples without crowding	NA	NA	Plastic	10% formalin in field, store in formalin for at least one week, soak in fresh water each day for three days, transfer to 50% isopropyl alcohol or 75% ethanol for indefinite storage
Benthic Macro-invertebrates	As needed to submerge samples without crowding	NA	NA		If processing in the field, 70% ethanol or 40% isopropyl alcohol. If processing in the lab immediately after collection, 95% ethanol. If processing in the lab at least a week after collection, 10% formalin. Transfer to 70% ethanol or 40% isopropyl alcohol for indefinite storage

[+] Preservation is performed in the field within 15 minutes of sample collection, except where otherwise indicated.

**Escherichia 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

Certificates from sample container manufacturers are maintained in a notebook by the LCRA ELS. All sample containers will be provided by the LCRA ELS and will be purchased pre-cleaned and disposable. Preservatives are added to sample containers by LCRA ELS prior to shipment to WMS. These preservatives include the type and volume necessary for each analytical method. No preservatives are added to bottles for parameters that do not require preservation. All samples will be shipped in ice to maintain the required temperature during shipment.

- The bacteriological sample containers are the 125 and 290 mL bottles from IDEXX.
- Brown polyethylene bottles are provided for chlorophyll-a sampling.

No bottles will be reused for water quality sampling.

Sample containers for biological monitoring will be plastic, leak-proof, high density polyethylene, wide-mouth bottles in various sizes. The appropriate size will be used to adequately store and preserve samples without crowding.

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 WMS PM, in consultation with the NETMWD PM and WMS 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 log book. 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 WMS 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 NETMWD PM and WMS PM. If a CAP is necessary (Figure C1.1), the WMS QAO will submit the CAP to the TCEQ CRP PM in a timely manner for review. Additionally, the WMS 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).

Precipitation data are obtained from USGS precipitation gauges located throughout the basin. Data from the USGS gauge located nearest to the monitoring station will be used. These data will be submitted to the TCEQ under parameter code 72053 (Days Since Precipitation Event) and 82554 (Rainfall in 7 Days Inclusive Prior to Sampling).

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 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
Was the sample filtered
Analyses required
Name of collector
Custody transfer signatures and dates and time of transfer
Bill of lading, if applicable

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., analyses) to be performed

Sample Handling

The WMS DM (or designee) will notify LCRA ELS prior to each sampling event with information regarding the expected sampling date and number of sample containers required. The LCRA ELS will deliver all sample containers, ice chests, and appropriate COC forms to a pre-determined location prior to each sampling event. The containers provided by LCRA ELS will be certified new, supplied with correct preservatives, and labeled accordingly. Quality control for sample containers will be provided by LCRA ELS.

The WMS DCS will be responsible for ensuring that samples are collected using approved TCEQ methods. A COC form will be completed for each sample collected during the sampling event. Samples will be shipped to LCRA ELS or arrangements will be made with LCRA ELS for sample pick up at a pre-determined location after each day's sampling event is completed to assure that the COC forms are correctly filled out and signed. The LCRA ELS transfer custodian will also see that the samples arrive within holding time constraints. LCRA ELS will have a sample custodian who examines all arriving samples for proper documentation and proper preservation. This custodian will accept delivery by signing the final portion of the COC form. The sample custodian will log and monitor the progress of the samples through the analysis stage. Internal sample handling, custody, and storage procedures are described in LCRA ELS's Quality Manual(s).

Sample Tracking Procedure Deficiencies and Corrective Action

All deficiencies associated with COC procedures, as described in this QAPP, are immediately reported to the NETMWD PM and WMS 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 WMS PM, in consultation with the NETMWD PM and WMS 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 WMS QAO 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. None of the parameters covered in this QAPP require the collection of field QC or field blank samples.

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.

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 the quality control data in the associated batch passes, it will be the decision of the laboratory QAO or WMS QAO 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, the NETMWD PM and WMS PM 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 NETMWD PM, in consultation with the WMS PM and WMS 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 NETMWD PM, WMS PM, and WMS QAO will be relied upon in evaluating results.

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 LCRA ELS Quality Manager. The LCRA ELS Quality Manager will discuss the failure with the NETMWD PM and WMS PM. If applicable, the WMS QAO 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 NETMWD and WMS, 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 (NETMWD) 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 the WMS PM. 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 or the manufacture's manual when appropriate. 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

Supplies and consumables which affect the quality of the sampling and analysis programs are specified and approved for use by the LCRA ELS Quality Manager. Those items include, but are not limited to: sample bottles, calibration gases, reagents, hoses, materials for decontamination of sampling equipment, deionized water, and potable water. Sample containers are new and purchased precleaned to EPA specifications by the laboratory. Calibration gases are purchased having known concentrations, and the documentation is maintained on file by the laboratory managers. Reagents are analytical grade or better. Hoses and sampling equipment are made of impervious materials that are suited for the materials being sampled. Deionized water used for rinsing sampling equipment between samples is typically obtained from the laboratory, and is shown to be free of contamination through daily conductivity testing; monthly bacteria, pH, and residual chlorine testing; and annual heavy metals testing. Refer to the laboratory QMs for all laboratory related items.

B7 Data Management

Data Management Process

The NETMWD CRP Database will be maintained and updated with data obtained from the Cypress Creek Basin CRP (routine and systematic stations, special studies, and flow studies). The process described below summarizes these procedures and guidelines.

Data collected through this monitoring program will be introduced into the NETMWD database by either manual entry, or digital electronic files by the WMS DM. In each case, the data will be screened to ensure (1) transcription accuracy, and (2) that the data meets the quality criteria for that data type (e.g., were holding times exceeded, were reporting limits met) prior to its submission to the TCEQ CRP PM.

This data management process will be used as guidance for the collection, quality assurance and archiving of all data collected pursuant to the Cypress Creek Basin CRP. This plan has been developed after a full assessment of the human, data, and computer resource needs of the CRP as appropriate for the Cypress Creek Basin. It is anticipated that the types of data to be collected and archived in the future may change, as future data retrieval, analysis and presentation needs may change.

With respect to the management of data generated in the Cypress Creek Basin CRP, the process begins with field sampling and ends with the data users with a typical line of transmission as follows:

1. Field Sampling
2. Sample Custodian
3. Lab Analyst
4. LCRA ELS Project Manager
5. WMS Project Manager
6. WMS Data Manager
7. WMS Quality Assurance Officer
8. Transfer of Data to TCEQ CRP Project Manager
9. TCEQ CRP Project Manager transfers data to TCEQ CRP Data Manager
10. TCEQ CRP Data Manager loads data into SWQMIS Production environment.

After the LCRA ELS PM has received data from the lab analyst, the LCRA ELS PM screens the data to ensure accuracy and that the data meets the quality criteria for that data type. The LCRA ELS Quality Manager validates the analytical data by comparing the various quality control measurements and by recalculating a random selection of the results produced by each analyst submitting data. The LCRA ELS PM, using the lab's standard reporting format, will provide results to the NETMWD and WMS PMs. The analytical laboratory will retain files of all quality assurance verifications for five years in accordance with NELAP and make them available for inspection on request.

Field and flow data are submitted to the WMS PM, are validated by the WMS QAO, and are included in data deliverables to the TCEQ by the WMS DM.

Scanned field forms and copies of COC forms will be sent by the WMS PM to the WMS DM and WMS QAO for data screening and quality assurance and data formatting. This information will be quality checked by the WMS DM by comparing it with the appropriate CRP monitoring schedule to verify that the correct stations have been sampled, that the correct sets of measurements and samples have been collected, and that calibration procedures have been correctly applied. The WMS DM will be responsible for the review of all field and laboratory-generated data for consistency with QA criteria, for accuracy of data entry, and for timely transfer to TCEQ. The WMS DM will also be responsible for ensuring that all field reports, calibration records, and general information are maintained and properly filed.

Upon completion of the review and entry into an electronic file, the WMS DM sends the file to the WMS QAO for review. The WMS QAO reviews all data recorded on the field sheets, calibration logs, and from the laboratory against the electronic file. The WMS QAO notifies the WMS DM of any discrepancies. The WMS PM will perform a secondary review at the request of the WMS QAO. Upon approval by the WMS QAO, the WMS DM converts the quality-assured data into pipe-delimited text format which is submitted to the TCEQ CRP PM for review. All data will be submitted in the format specified in the latest version of the DMRG. The TCEQ CRP PM will submit the file to the TCEQ CRP DM for review and loading into the SWQMIS database. Once these procedures have been completed, copies of all data reports and QA records will be retained for the periods described in Table A12.1.

Data will only be excluded from the NETWMD data set files if it is determined to be erroneous or is found to have been collected in a manner that does not follow the TCEQ guidelines for data procurement. The WMS DM will alert the WMS PM to any abnormalities or apparent outliers. The WMS PM, in consultation with the WMS QAO and NETMWD PM, will evaluate the data and determine if any statistical tests need to be performed to further evaluate the data. The suspect data will be recorded in the DM's QC data log, noting the reason for its exclusion. A summary will be provided in the data summary report, as well as any appropriate corrective actions.

Paper copies of all field sheets and calibration logs are maintained at the WMS offices in Sulphur Springs, Texas and transferred annually to the NETMWD office in Hughes Springs, Texas where they are stored for the required duration defined in Table A12.1. Requests for data should be made to the NETMWD PM.

Data Dictionary

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

A table outlining the entities that will be used when submitting data under this QAPP is included below for the purpose of verifying which entity codes are included in this QAPP.

Monitoring Entity	Tag Prefix	Submitting Entity	Collecting Entity
Northeast Texas Municipal Water District	CY	NT	
Water Monitoring Solutions, Inc.	CY	NT	WM

Data Errors and Loss

The WMS PM and NETMWD PM will be responsible for determining what data, if any, will be excluded from the NETMWD Cypress Creek Basin CRP Database. The WMS QAO and LCRA ELS Quality Manager will initially review any questions concerning analytical data. If a modification of the data originally reported is deemed necessary, documentation of the original data, the question concerning that data, and the modified data, along with the copies of the data change, will be saved electronically.

The WMS DM produces data files in Microsoft Excel formats, and transfers to the pipe-delimited text file format before submitting the data to the TCEQ. The file format utilized involves the established event and result file formats. Presently, the WMS DM manually reviews all data for the established minimum and maximum values, AWRL limits set for each parameter by the TCEQ, and LOQ limits set for each parameter by the lab.

First, any values flagged during review will be checked against the laboratory report to see if there are transcription errors. If the values are correct, then an e-mail querying the validity of the value reported will be sent to the laboratory. Values that are verified as correct by the laboratory will be flagged as outliers within the data set. In addition to the review check, a minimum 10% check is done on all data sets by the WMS QAO prior

to their conversion to text files. A data review checklist and data summary form (Appendix F) will be included with the submittal of the completed data set. This summary form includes data information and comments specific to the data set.

Care must be taken to ensure that all Excel files exported are in pipe-delimited text format (following the guidelines in the SWQM DMRG, most recent version) to ensure correct transfer of all information. File transfer and checking is initially the responsibility of the WMS DM.

Preparation of data files is dependent on the use of forms and checklists, some of which are available in the appendices of this QAPP. These documents include: 1) Field documentation which contains all instrument calibration/standards records, field measurements, and site characteristics (Appendix D), 2) Field notes, 3) Laboratory documentation including analyst's comments on the condition of the sample and progress of the analysis, raw data, instrument printouts, results of calibration, QA checks, external and internal standards records, and SOPs, and 4) COC forms (Appendix E).

Record Keeping and Data Storage

All data files and GIS data layers will be stored on the NETMWD server and WMS computers. A full backup of all WMS files is completed weekly and stored in a cloud-based server and on external drives. Electronic data and reports will be submitted to NETMWD after the end of each quarter. All paper documents are scanned, and the paper documents are transferred to the NETMWD annually. In addition, all data files and reports concerning the project are available to the TCEQ CRP PM upon request.

The disaster recovery procedure consists of reinstalling the operation system and software from the original software media. Electronic files will be replaced from the weekly backup files, if necessary.

Data Handling, Hardware, and Software Requirements

All data are stored on Microsoft Windows© based computers and manipulated using the Microsoft Office suite of programs. Files may be saved to Adobe Acrobat Portable Document Format (PDF) for storage. Laboratory data will be housed in LCRA ELS's Chemware© Horizon LIMS. Once reports are generated, PDF and Microsoft Excel copies will be delivered to the NETMWD and WMS PMs.

All field data except flow are recorded on paper field sheets. After collection, the documents are scanned and converted to PDF format. These files are then transferred to the WMS PM for archiving and distribution to the WMS QAO and WMS DM as above.

When flow is measured using the FlowTracker2, the system-generated file provides the total flow for each event. This information is saved as an external document in PDF format.

Information Resource Management Requirements

The information management specifications include TCEQ as well as NETMWD and WMS internal information management controls. The TCEQ has the following data specification requirements: the DMRG and GIS Policy (TCEQ OPP 8.11). Note that GPS certification is not required for positional data that will be used for photo interpolation in the Station Location (SLOC) request process.

Data will be managed in accordance with the TCEQ DMRG (most recent revision) and applicable NETMWD 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	NETMWD	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 NETMWD	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	One audit per sub-participant prior to the expiration of the QAPP	NETMWD	Field sampling, handling and measurement; facility review; and data management as they relate to CRP	30 days to respond in writing to the NETMWD. The NETMWD will report problems 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 NETMWD and WMS 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 NETMWD PM and WMS 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 NETMWD PM, in consultation with the WMS PM and 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 NETMWD or WMS concerning deficiencies associated with CRP work. This includes the TCEQ CRP Team Leader, PM, Project QAS, and Lead QAS. The WMS QAO should submit CAPs to their assigned TCEQ CRP PM in a timely manner. NETMWD and WMS 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 WMS QAO for revision. All CAPs for a FY should be cataloged in the quarterly progress reports submitted to the TCEQ CRP PM by the WMS 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 NETMWD PM or WMS PM are 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 the NETMWD PM and WMS 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.

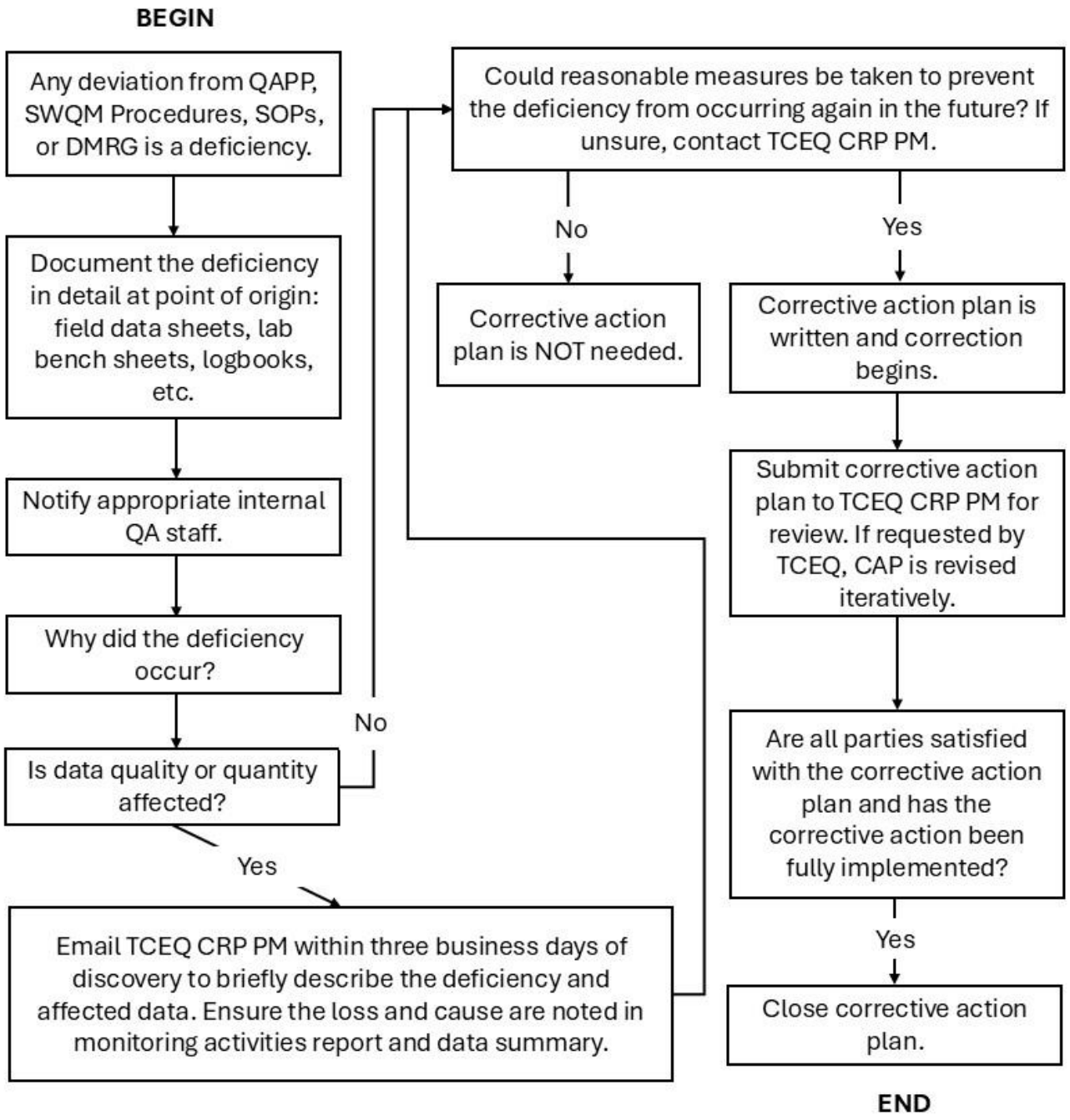
Corrective Action

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	WMS PM, WMS QAO, LCRA ELS Quality Manager	NETMWD PM, LCRA ELS PM, TCEQ CRP PM
CRP 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	WMS PM	NETMWD PM, TCEQ CRP PM
Monitoring Systems Audit Report and Response	Once per biennium	By the contracted due date	NETMWD PM	WMS PM, TCEQ CRP PM
Data Summary	Three times per year	By the contracted due date	WMS DM	NETMWD PM, TCEQ CRP PM

Reports to NETMWD Project Management

Each quarter, the WMS QAO will review QA laboratory results and field sheets. Reports with any corrective actions that occurred will be sent quarterly to the WMS PM for review. The WMS PM will then review and transmit these reports to the NETMWD PM prior to sending it to TCEQ for their review. The LCRA ELS Project Manager will submit data and QA/QC reports within 30 days of the receipt of samples for analysis to the NETMWD and WMS PM. For aquatic life monitoring, field forms will be transferred to the NETMWD by WMS. The Biological Field Data Sheets (Appendix D) will be completed and submitted to the NETMWD along with the event/result text and BLOB files.

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 NETMWD's and WMS'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 NETMWD, 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 NETMWD 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 WMS DM and WMS 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 WMS QAO 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 the WMS DM 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	Data Manager Task
Sample documentation complete; samples labeled, sites identified	WMS DCS		WMS QAO	
Field QC samples collected for all analytes as prescribed in the TCEQ SWQM Procedures	WMS DCS	LCRA ELS QUALITY MANAGER	WMS QAO	
Standards and reagents traceable	WMS DCS	LCRA ELS QUALITY MANAGER	WMS QAO	
Chain of custody complete/acceptable	WMS DCS	LCRA ELS QUALITY MANAGER	WMS QAO	
NELAP Accreditation is current		LCRA ELS QUALITY MANAGER	WMS QAO	
Sample preservation and handling acceptable	WMS QAO	LCRA ELS QUALITY MANAGER		
Holding times not exceeded		LCRA ELS QUALITY MANAGER	WMS QAO	
Collection, preparation, and analysis consistent with SOPs and QAPP	WMS DCS	LCRA ELS QUALITY MANAGER	WMS QAO	WMS DM
Field documentation (e.g., biological, stream habitat) complete	WMS PM, WMS DCS			WMS DM
Instrument calibration data complete	WMS PM, WMS DCS	LCRA ELS QUALITY MANAGER	WMS QAO	
QC samples analyzed at required frequency		LCRA ELS QUALITY MANAGER	WMS QAO	
QC results meet performance and program specifications		LCRA ELS QUALITY MANAGER	WMS QAO	
Analytical sensitivity (LOQ/AWRL) consistent with QAPP		LCRA ELS QUALITY MANAGER	WMS QAO	WMS DM
Results, calculations, transcriptions checked		LCRA ELS QUALITY MANAGER	WMS QAO	WMS DM
Laboratory bench-level review performed		LCRA ELS QUALITY MANAGER		
All laboratory samples analyzed for all scheduled parameters		LCRA ELS QUALITY MANAGER	WMS QAO	WMS DM
Corollary data agree		LCRA ELS QUALITY MANAGER	WMS QAO	
Nonconforming activities documented		LCRA ELS QUALITY MANAGER	WMS QAO	WMS DM
Outliers confirmed and documented; reasonableness check performed			WMS DM	
Dates formatted correctly				WMS DM
Depth reported correctly and in correct units				WMS DM
TAG IDs correct				WMS DM
TCEQ Station ID number assigned				WMS DM

Data to be Verified	Field Task	Laboratory Task	QA Task	Data Manager Task
Valid parameter codes				WMS DM
Codes for submitting entity(ies), collecting entity(ies), and monitoring type(s) used correctly				WMS DM
Time based on 24-hour clock				WMS DM
Check for transcription errors			WMS QAO	WMS DM
Sampling and analytical data gaps checked (e.g., all sites for which data are reported are on the coordinated monitoring schedule)			WMS QAO	WMS DM
Field instrument pre- and post-calibration check results within limits			WMS QAO	WMS DM
10% of data manually reviewed			WMS QAO	WMS 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–A6.9 : Measurement Performance Specifications

TABLE A6.1 Measurement Performance Specifications for NETMWD (data collected by WMS)					
Field Parameters					
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE) *	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	NA	00020	Field
RESERVOIR ACCESS NOT POSSIBLE LEVEL TOO LOW ENTER 1 IF REPORTING	NS	other	TCEQ Drought Guidance	00051	Field
RESERVOIR STAGE (FEET ABOVE MEAN SEA LEVEL) **	FT ABOVE MSL	water	TWDB	00052	Field
RESERVOIR PERCENT FULL**	% RESERVOIR CAPACITY	water	TWDB	00053	Field
TRANSPARENCY, SECCHI DISC (METERS)*	meters	water	TCEQ SOP V1	00078	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C) *	µs/cm	water	EPA 120.1 and TCEQ SOP, V1	00094	Field
OXYGEN, DISSOLVED (MG/L) *	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	Field
PH (STANDARD UNITS) *	s.u.	water	EPA 150.1and TCEQ SOP V1	00400	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)***	meters	other	TCEQ SOP V2	89864	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)***	meters	other	TCEQ SOP V2	89865	Field
POOL LENGTH, METERS***	meters	other	TCEQ SOP V2	89869	Field
% POOL COVERAGE IN 500 METER REACH***	%	other	TCEQ SOP V2	89870	Field
WIND DIRECTION (1=N, 2=S, 3=E, 4=W, 5=NE, 6=SE, 7=NW, 8=SW)	NU	other	NA	89010	Field
WIND INTENSITY (1=CALM,2=SLIGHT,3=MOD.,4=STRONG)	NU	other	NA	89965	Field
PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=CLDY,4=RAIN,5=OTHER)	NU	other	NA	89966	Field
WATER SURFACE (1=CALM,2=RIPPLE,3=WAVE,4=WHITECAP)	NU	water	NA	89968	Field
WATER COLOR 1=BRWN 2=RED 3=GRN 4=BLCK 5=CLR 6=OTHER	NU	water	NA	89969	Field
WATER ODOR (1=SEWAGE, 2=OILY/CHEMICAL, 3=ROTTEN EGGS, 4=MUSKY, 5=FISHY, 6=NONE, 7=OTHER (WRITE IN COMMENTS))	NU	water	NA	89971	Field
OXYGEN, DISSOLVED (PERCENT OF SATURATION)	% SAT	water	TCEQ SOP V1	00301	Field
WATER CLARITY, 1=EXCELLENT 2=GOOD 3=FAIR 4=POOR	NU	water	NA	20424	Field
RAINFALL IN 7 DAYS INCLUSIVE PRIOR TO SAMP. (IN)	IN	Other	NA	82554	Field

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** As published by the Texas Water Development Board on their website https://www.waterdatafortexas.org/reservoirs/statewide
*** To be routinely reported when collecting data from perennial pools.
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 A6.2 Measurement Performance Specifications for NETMWD (data collected by WMS)

Flow Parameters

Parameter	Units	Matrix	Method	Parameter Code	Lab
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=H igh,6=Dry	NU	water	TCEQ SOP V1	01351	Field
STREAM FLOW ESTIMATE (CFS)	cfs	Water	TCEQ SOP V1	74069	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	Field

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

TABLE A6.3 Measurement Performance Specifications for NETMWD (data collected by WMS)										
Conventional Parameters in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD of LCS/LCSD)**	**Bias %Rec. of LCS**	**Lab**
ALKALINITY, TOTAL (MG/L AS CACO3)	mg/L	water	SM 2320 B	00410	20	20	NA	20	NA	LCRA ELS
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540 D	00530	5	1	NA	NA	NA	LCRA ELS
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.1 Rev. 2.0 (1993)	00610	0.1	0.02	70-130	20	80-120	LCRA ELS
NITRITE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00615	0.05	0.02	70-130	20	80-120	LCRA ELS
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	0.05	0.02	70-130	20	80-120	LCRA ELS
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2 Rev. 2.0 (1993)	00625	0.2	0.2	70-130	20	80-120	LCRA ELS
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.4	00665	0.06	0.02	70-130	20	80-120	LCRA ELS
CARBON, TOTAL ORGANIC, NPOC (TOC), MG/L	mg/L	water	SM 5310 C	00680	2	0.5	NA	NA	NA	LCRA ELS
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	5	70-130	20	80-120	LCRA ELS
SULFATE (MG/L AS SO4)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00945	5	5	70-130	20	80-120	LCRA ELS
PHEOPHYTIN-A UG/L FLUOROMETRIC METHOD	µg/L	water	EPA 445.0	32213	3	2	NA	NA	NA	LCRA ELS
CHLOROPHYLL-A, FLUOROMETRIC METHOD, UG/L	µg/L	water	EPA 445.0	70953	3	2	NA	20	80-120	LCRA ELS

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).

TABLE A6.4 Measurement Performance Specifications for NETMWD (data collected by WMS)										
Bacteriological Parameters in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Log Difference of Duplicates**	**Bias %Rec. of LCS**	**Lab**
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	SM 9223-B**	31699	1	1	NA	0.5*	NA	LCRA ELS
E.COLI, COLILERT, IDEXX, HOLDING TIME	hours	water	NA	31704	NA	NA	NA	NA	NA	LCRA ELS

* 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.
** E.coli samples analyzed by these methods should always be processed as soon as possible and within 8 hours. 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.

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 NETMWD (data collected by WMS)					
24 Hour Parameters in Water					
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE), 24HR AVG	DEG C	Water	TCEQ SOP V1	00209	Field
WATER TEMPERATURE, DEGREES CENTIGRADE, 24HR MAX	DEG C	Water	TCEQ SOP V1	00210	Field
TEMPERATURE, WATER (DEGREES CENTIGRADE) 24HR MIN	DEG C	Water	TCEQ SOP V1	00211	Field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR AVG	µS/cm	Water	TCEQ SOP V1	00212	Field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MAX	µS/cm	Water	TCEQ SOP V1	00213	Field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MIN	µS/cm	Water	TCEQ SOP V1	00214	Field
PH, S.U., 24HR MAXIMUM VALUE	std. units	Water	TCEQ SOP V1	00215	Field
PH, S.U., 24HR, MINIMUM VALUE	std. units	Water	TCEQ SOP V1	00216	Field
WATER TEMPERATURE, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00221	Field
SPECIFIC CONDUCTANCE, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00222	Field
pH, # OF MEASUREMENTS IN 24- HRS	NU	Water	TCEQ SOP V1	00223	Field
DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89855	Field
DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89856	Field
DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89857	Field
DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	89858	Field
References: 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 NETMWD (data collected by WMS)					
Habitat Parameters for Aquatic Life Monitoring					
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**Lab**
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	Water	TCEQ SOP V2	00061	Field
BIOLOGICAL DATA	NS	Other	NA/Calculation	89888	Field
STREAM TYPE; 1=PERENNIAL 2=INTERMITTENT S/PERENNIAL POOLS 3=INTERMITTENT 4=UNKNOWN	NU	Water	NA/Calculation	89821	Field
STREAMBED SLOPE (M/KM)	M/KM	Other	NA/Calculation	72051	Field
AVERAGE PERCENTAGE INSTREAM COVER	%	Other	TCEQ SOP V2	84159	Field
STREAM ORDER	NU	Water	TCEQ SOP V2	84161	Field
NUMBER OF LATERAL TRANSECTS MADE	NU	Other	TCEQ SOP V2	89832	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	Other	TCEQ SOP V2	89835	Field
TOTAL NUMBER OF STREAM BENDS	NU	Other	TCEQ SOP V2	89839	Field
NUMBER OF WELL DEFINED STREAM BENDS	NU	Other	TCEQ SOP V2	89840	Field
NUMBER OF MODERATELY DEFINED STREAM BENDS	NU	Other	TCEQ SOP V2	89841	Field
NUMBER OF POORLY DEFINED STREAM BENDS	NU	Other	TCEQ SOP V2	89842	Field
TOTAL NUMBER OF RIFFLES	NU	Other	TCEQ SOP V2	89843	Field
DOMINANT SUBSTRATE TYPE (1=CLAY, 2=SILT, 3=SAND, 4=GRAVEL, 5=COBBLE, 6=BOULDER, 7=BEDROCK, 8=OTHER)	NU	Sediment	TCEQ SOP V2	89844	Field
AVERAGE PERCENT OF SUBSTRATE GRAVEL SIZE OR LARGER	%	Other	TCEQ SOP V2	89845	Field
AVERAGE STREAM BANK EROSION (%)	%	Other	TCEQ SOP V2	89846	Field
AVERAGE STREAM BANK SLOPE (DEGREES)	deg	Other	TCEQ SOP V2	89847	Field
HABITAT FLOW STATUS, 1=NO FLOW, 2=LOW,3=MOD,4=HIGH	NU	Other	TCEQ SOP V2	89848	Field
AVERAGE PERCENT TREES AS RIPARIAN VEGETATION	%	Other	TCEQ SOP V2	89849	Field

AVERAGE PERCENT SHRUBS AS RIPARIAN VEGETATION	%	Other	TCEQ SOP V2	89850	Field
AVERAGE PERCENT GRASS AS RIPARIAN VEGETATION	%	Other	TCEQ SOP V2	89851	Field
AVERAGE PERCENT CULTIVATED FIELDS AS RIPARIAN VEGETATION	%	Other	TCEQ SOP V2	89852	Field
AVERAGE PERCENT OTHER AS RIPARIAN VEGETATION	%	Other	TCEQ SOP V2	89853	Field
AVERAGE PERCENTAGE OF TREE CANOPY COVERAGE	%	Other	TCEQ SOP V2	89854	Field
DRAINAGE AREA ABOVE MOST DOWNSTREAM TRANSECT*	km2	Other	TCEQ SOP V2	89859	Field
REACH LENGTH OF STREAM EVALUATED (M)	m	Other	NA/Calculation	89884	Field
AVERAGE STREAM WIDTH (METERS)	M	Other	TCEQ SOP V2	89861	Field
AVERAGE STREAM DEPTH (METERS)	M	Other	TCEQ SOP V2	89862	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)	M	Other	TCEQ SOP V2	89864	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)	M	Other	TCEQ SOP V2	89865	Field
AVERAGE WIDTH OF NATURAL RIPARIAN VEGETATION (M)	M	Other	TCEQ SOP V2	89866	Field
AVERAGE WIDTH OF NATURAL RIPARIAN BUFFER ON LEFT BANK (M)	M	Other	NA/Calculation	89872	Field
AVERAGE WIDTH OF NATURAL RIPARIAN BUFFER ON RIGHT BANK (M)	m	Other	NA/Calculation	89873	Field
AESTHETICS OF REACH (1=WILD 2=NAT. 3=COMM. 4=OFF.)	NU	Other	TCEQ SOP V2	89867	Field
NUMBER OF STREAM COVER TYPES	NU	Other	TCEQ SOP V2	89929	Field
LAND DEVELOP IMPACT (1=UNIMP,2=LOW,3=MOD,4=HIGH)	NU	Other	TCEQ SOP V2	89962	Field
RIPARIAN VEGETATION %; LEFT BANK - TREES	%	Other	NA/Calculation	89822	Field
RIPARIAN VEGETATION %; RIGHT BANK - TREES	%	Other	NA/Calculation	89823	Field
RIPARIAN VEGETATION %; LEFT BANK SHRUBS	%	Other	NA/Calculation	89824	Field
RIPARIAN VEGETATION %; RIGHT BANK - SHRUBS	%	Other	NA/Calculation	89825	Field
RIPARIAN VEGETATION %: LEFT BANK - GRASSES OR FORBS	%	Other	NA/Calculation	89826	Field
RIPARIAN VEGETATION %; RIGHT BANK - GRASSES OR FORBS	%	Other	NA/Calculation	89827	Field
RIPARIAN VEGETATION %: LEFT BANK - CULTIVATED FIELDS	%	Other	NA/Calculation	89828	Field
RIPARIAN VEGETATION %: RIGHT BANK - CULTIVATED FIELDS	%	Other	NA/Calculation	89829	Field
RIPARIAN VEGETATION %: LEFT BANK – OTHER	%	Other	NA/Calculation	89830	Field
RIPARIAN VEGETATION %: RIGHT BANK - OTHER	%	Other	NA/Calculation	89871	Field
AVAILABLE INSTREAM COVER HQI SCORE: 4=ABUNDANT 3=COMMON 2=RARE 1=ABSENT	NU	Other	NA/Calculation	89874	Field
BOTTOM SUBSTRATE STABILITY HQI SCORE: 4=STABLE 3=MODERATELY STABLE 2=MODERATELY UNSTABLE 1=UNSTABLE	NU	Other	NA/Calculation	89875	Field
NUMBER OF RIFFLES HQI SCORE: 4=ABUNDANT 3=COMMON 2=RARE 1=ABSENT	NS	Other	NA/Calculation	89876	Field
DIMENSIONS OF LARGEST POOL HQI SCORE: 4=LARGE 3=MODERATE 2=SMALL 1=ABSENT	NU	Other	NA/Calculation	89877	Field
CHANNEL FLOW STATUS HQI SCORE: 3=HIGH 2=MODERATE 1=LOW 0=NO FLOW	NU	Other	NA/Calculation	89878	Field
BANK STABILITY HQI SCORE: 3=STABLE 2=MODERATELY STABLE 1=MODERATELY UNSTABLE 0=UNSTABLE	NU	Other	NA/Calculation	89879	Field
CHANNEL SINUOSITY HQI SCORE: 3=HIGH 2=MODERATE 1=LOW 0=NONE	NU	Other	NA/Calculation	89880	Field
RIPARIAN BUFFER VEGETATION HQI SCORE: 3=EXTENSIVE 2=WIDE 1=MODERATE 0=NARROW	NU	Other	NA/Calculation	89881	Field
AESTHETICS OF REACH HQI SCORE: 3=WILDERNESS 2=NATURAL AREA 1=COMMON SETTING 0=OFFENSIVE	NU	Other	NA/Calculation	89882	Field
HQI TOTAL SCORE	NU	Other	NA/Calculation	89883	Field
LENGTH OF STREAM EVALUATED (KM)	KM	Other	NA/Calculation	89860	Field
ECOREGION LEVEL III (TEXAS ECOREGION CODE)	NU	Other	TCEQ SOP V1	89961	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	Field
NO FLOW ISOLATED POOL: LARGEST POOL MAX WIDTH (M)**	M	Other	NA/Calculation	89908	Field
NO FLOW ISOLATED POOL: LARGEST POOL MAX LENGTH (M)**	M	Other	NA/Calculation	89909	Field
NO FLOW ISOLATED POOL: LARGEST POOL MAX DEPTH (M)**	M	Other	NA/Calculation	89910	Field
NO FLOW ISOLATED POOL: SMALLEST POOL MAX DEPTH (M)**	M	Other	NA/Calculation	89911	Field
NO FLOW ISOLATED POOL: SMALLEST POOL MAX WIDTH (M) **	M	Other	NA/Calculation	89912	Field

NO FLOW ISOLATED POOL: SMALLEST POOL MAX LENGTH (M)**	M	Other	NA/Calculation	89913	Field
NO FLOW ISOLATED POOLS: NUMBER OF POOLS EVALUATED**	NU	Other	NA/Calculation	89914	Field

* From USGS map.
** To be reported when collecting data from perennial pools.

References:
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 NETMWD (data collected by WMS)

Quantitative Benthic Parameters for Aquatic Life Monitoring

Parameter	Units	Matrix	Method	Parameter Code	Lab
STREAM ORDER	NU	Water	TCEQ SOP, V1	84161	Field
BIOLOGICAL DATA	NS	Other	NA/Calculation	89888	Field
QUANTITATIVE PROTOCOLS REGIONAL BENTHIC MACROINVERTEBRATE IBI SCORE	NS	Other	NA/Calculation	90085	Field
BENTHIC DATA REPORTING UNITS (1=NUMBER OF INDIVIDUALS IN SUB-SAMPLE, 2=NUMBER OF INDIVIDUALS/FT2, 3=NUMBER OF INDIVIDUALS/M2, 4=TOTAL NUMBER OF INDIVIDUALS IN SAMPLE)	NU	Other	TCEQ SOP V2	89899	Field
UNDERCUT BANK AT COLLECTION POINT (%)	%	Other	TCEQ SOP V2	89921	Field
OVERHANGING BRUSH AT COLLECTION POINT (%)	%	Other	TCEQ SOP V2	89922	Field
GRAVEL BOTTOM AT COLLECTION POINT (%)	%	Sediment	TCEQ SOP V2	89923	Field
SAND BOTTOM AT COLLECTION POINT (%)	%	Sediment	TCEQ SOP V2	89924	Field
SOFT BOTTOM AT COLLECTION POINT (%)	%	Sediment	TCEQ SOP V2	89925	Field
MACROPHYTE BED AT COLLECTION POINT (%)	%	Other	TCEQ SOP V2	89926	Field
SNAGS AND BRUSH AT COLLECTION POINT (%)	%	Other	TCEQ SOP V2	89927	Field
BEDROCK STREAMBED AT COLLECTION POINT (%)	%	Sediment	TCEQ SOP V2	89928	Field
MESH SIZE, ANY NET OR SIEVE, AVERAGE BAR (CM)	cm	Other	TCEQ SOP V2	89946	Field
BENTHIC SAMPLE COLLECTION METHOD (1=SURBER, 2=EKMAN, 3=KICKNET, 4=PETERSON, 5=HESTER DENDY, 6=SNAG, 7=HESS)	NU	Other	TCEQ SOP V2	89950	Field
ECOREGION LEVEL III (TEXAS ECOREGION CODE)	NU	Other	TCEQ SOP V1	89961	Field
BENTHOS ORGANISMS -NONE PRESENT (0=NONE PRESENT)	NS	Other	TCEQ SOP V2	90005	Field
BENTHIC GRAZERS, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90020	Field
BENTHIC GATHERERS, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90025	Field
BENTHIC FILTERERS, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90030	Field
TOTAL TAXA RICHNESS, BENTHOS	NU	Other	TCEQ SOP V2	90055	Field
NUMBER OF DIPTERA TAXA	NU	Other	TCEQ SOP V2	90056	Field
NUMBER OF EPHEMEROPTERA TAXA	NU	Other	TCEQ SOP V2	90057	Field
TOTAL NUMBER OF INTOLERANT TAXA, BENTHOS	NU	Other	TCEQ SOP V2	90058	Field
EPT, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90060	Field
CHIRONOMIDAE, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90062	Field
BENTHIC SHREDDERS (% OF COMMUNITY)	%	Other	TCEQ SOP V2	90035	Field
TOTAL # OF FAMILIES IN BENTHIC SAMPLE	NU	Other	TCEQ SOP V2	90012	Field
TOLERANT BENTHOS, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90066	Field
DOMINANT 3 TAXA, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90067	Field
TOTAL # OF BENTHIC GENERA IN SAMPLE	NU	Other	TCEQ SOP V2	90011	Field
Species Enumeration	#	Benthics	NA/Calculation	Various	WMS

References:
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 A6.8 Measurement Performance Specifications for NETMWD (data collected by WMS)

Qualitative Benthic Parameters for Aquatic Life Monitoring

Parameter	Units	Matrix	Method	Parameter Code	Lab
STREAM ORDER	NU	Water	TCEQ SOP, V1	84161	Field
BIOLOGICAL DATA	NS	Other	NA/Calculation	89888	Field
RAPID BIOASSESSMENT PROTOCOLS BENTHIC MACROINVERTEBRATE IBI SCORE	NS	Other	NA/Calculation	90081	Field
BENTHIC DATA REPORTING UNITS (1=NUMBER OF INDIVIDUALS IN SUB-SAMPLE, 2=NUMBER OF INDIVIDUALS/FT2, 3=NUMBER OF INDIVIDUALS/M2, 4=TOTAL NUMBER OF INDIVIDUALS IN SAMPLE)	NU	Other	TCEQ SOP V2	89899	Field
KICKNET EFFORT, MINUTES KICKED (MIN.)	min.	Other	TCEQ SOP V2	89904	Field
NUMBER OF INDIVIDUALS IN BENTHIC SAMPLE	NU	Other	TCEQ SOP V2	89906	Field
UNDERCUT BANK AT COLLECTION POINT (%)	%	Other	TCEQ SOP V2	89921	Field
OVERHANGING BRUSH AT COLLECTION POINT (%)	%	Other	TCEQ SOP V2	89922	Field
GRAVEL BOTTOM AT COLLECTION POINT (%)	%	Sediment	TCEQ SOP V2	89923	Field
SAND BOTTOM AT COLLECTION POINT (%)	%	Sediment	TCEQ SOP V2	89924	Field
SOFT BOTTOM AT COLLECTION POINT (%)	%	Sediment	TCEQ SOP V2	89925	Field
MACROPHYTE BED AT COLLECTION POINT (%)	%	Other	TCEQ SOP V2	89926	Field
SNAGS AND BRUSH AT COLLECTION POINT (%)	%	Other	TCEQ SOP V2	89927	Field
BEDROCK STREAMBED AT COLLECTION POINT (%)	%	Sediment	TCEQ SOP V2	89928	Field
MESH SIZE, ANY NET OR SIEVE, AVERAGE BAR (CM)	cm	Other	TCEQ SOP V2	89946	Field
BENTHIC SAMPLE COLLECTION METHOD (1=SURBER, 2=EKMAN, 3=KICKNET, 4=PETERSON, 5=HESTER DENDY, 6=SNAG, 7=HESS)	NU	Other	TCEQ SOP V2	89950	Field
ECOREGION LEVEL III (TEXAS ECOREGION CODE)	NU	Other	TCEQ SOP V1	89961	Field
BENTHOS ORGANISMS -NONE PRESENT (0=NONE PRESENT)	NS	Other	TCEQ SOP V2	90005	Field
HILSENHOFF BIOTIC INDEX (HBI)	NU	Other	TCEQ SOP V2	90007	Field
NUMBER OF EPT INDEX	NU	Other	TCEQ SOP V2	90008	Field
DOMINANT BENTHIC FUNCTIONAL FEEDING GRP, % OF INDIVIDUALS	%	Other	TCEQ SOP V2	90010	Field
BENTHIC GATHERERS, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90025	Field
BENTHIC PREDATORS, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90036	Field
DOMINANT TAXON, BENTHOS PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90042	Field
RATIO OF INTOLERANT TO TOLERANT TAXA, BENTHOS	NU	Other	TCEQ SOP V2	90050	Field
NUMBER OF NON-INSECT TAXA	NU	Other	TCEQ SOP V2	90052	Field
ELMIDAE, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90054	Field
TOTAL TAXA RICHNESS, BENTHOS	NU	Other	TCEQ SOP V2	90055	Field
CHIRONOMIDAE, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90062	Field
PERCENT OF TOTAL TRICHOPTERA INDIVIDUALS AS HYDROPSYCHIDAE	%	Other	TCEQ SOP V2	90069	Field
TOTAL # OF BENTHIC GENERA IN SAMPLE	NU	Other	TCEQ SOP V2	90011	Field
BENTHIC SHREDDERS (% OF COMMUNITY)	%	Other	TCEQ SOP V2	90035	Field
TOTAL # OF FAMILIES IN BENTHIC SAMPLE	NU	Other	TCEQ SOP V2	90012	Field
DIP NET EFFORT, AREA SWEPT (SQ. METER)	m2	Other	TCEQ SOP V2	89902	Field
KICKNET EFFORT, AREA KICKED (SQ. METER)	m2	Other	TCEQ SOP V2	89903	Field
Species Enumeration	#	Benthics	NA/Calculation	Various	WMS

References:
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 A6.9 Measurement Performance Specifications for NETMWD (data collected by WMS)

Nekton Parameters for Aquatic Life Monitoring

Parameter	Units	Matrix	Method	Parameter Code	Lab
STREAM ORDER	NU	Water	TCEQ SOP V1	84161	Field
NEKTON TEXAS REGIONAL IBI SCORE	NS	Other	NA/Calculation	98123	Field
BIOLOGICAL DATA	NS	Other	NA/Calculation	89888	Field
SEINE, MINIMUM MESH SIZE, AVERAGE BAR, NEKTON, IN	IN	Other	TCEQ SOP V2	89930	Field
SEINE, MAXIMUM MESH SIZE, AVG BAR, NEKTON, INCH	IN	Other	TCEQ SOP V2	89931	Field
NET LENGTH (METERS)	M	Other	TCEQ SOP V2	89941	Field
ELECTROFISHING METHOD 1=BOAT 2=BACKPACK 3=TOTEBARGE	NU	Other	TCEQ SOP V2	89943	Field
ELECTROFISH EFFORT, DURATION OF SHOCKING (SEC)	SEC	Other	TCEQ SOP V2	89944	Field
SEINING EFFORT (# OF SEINE HAULS)	NU	Other	TCEQ SOP V2	89947	Field
COMBINED LENGTH OF SEINE HAULS (METERS)	M	Other	TCEQ SOP V2	89948	Field
SEINING EFFORT, DURATION (MINUTES)	MIN	Other	TCEQ SOP V2	89949	Field
ECOREGION LEVEL III (TEXAS ECOREGION CODE)	NU	Other	TCEQ SOP V1	89961	Field
AREA SEINED (SQ METERS)	M2	Other	TCEQ SOP V2	89976	Field
NUMBER OF SPECIES, FISH	NU	Other	TCEQ SOP V2	98003	Field
NEKTON ORGANISMS-NONE PRESENT (0=NONE PRESENT)	NS	Other	TCEQ SOP V2	98005	Field
TOTAL NUMBER OF SUNFISH SPECIES	NU	Other	TCEQ SOP V2	98008	Field
TOTAL NUMBER OF INTOLERANT SPECIES, FISH	NU	Other	TCEQ SOP V2	98010	Field
PERCENT OF INDIVIDUALS AS OMNIVORES, FISH	%	Other	TCEQ SOP V2	98017	Field
PERCENT OF INDIVIDUALS AS INVERTIVORES, FISH	%	Other	TCEQ SOP V2	98021	Field
PERCENT OF INDIVIDUALS AS PISCIVORES, FISH	%	Other	TCEQ SOP V2	98022	Field
PERCENT OF INDIVIDUALS WITH DISEASE OR ANOMALY	%	Other	TCEQ SOP V2	98030	Field
TOTAL NUMBER OF NATIVE CYPRINID SPECIES	NU	Other	TCEQ SOP V2	98032	Field
PERCENT INDIVIDUALS AS NON-NATIVE FISH SPECIES (% OF COMMUNITY)	%	Other	TCEQ SOP V2	98033	Field
TOTAL NUMBER OF INDIVIDUALS SEINING	NU	Other	TCEQ SOP V2	98039	Field
TOTAL NUMBER OF INDIVIDUALS ELECTROFISHING	NU	Other	TCEQ SOP V2	98040	Field
TOTAL NUMBER OF BENTHIC INVERTIVORE SPECIES	NU	Other	TCEQ SOP V2	98052	Field
TOTAL NUMBER OF BENTHIC FISH SPECIES	NU	Other	TCEQ SOP V2	98053	Field
NUMBER OF INDIVIDUALS PER SEINE HAUL	NU	Other	TCEQ SOP V2	98062	Field
NUMBER OF INDIVIDUALS PER MINUTE ELECTROFISHING	NU	Other	TCEQ SOP V2	98069	Field
PERCENT INDIVIDUALS AS TOLERANT FISH SPECIES (EXCLUDING WESTERN MOSQUITOFISH)	%	Other	TCEQ SOP V2	98070	Field
TOTAL NUMBER OF SUCKER SPECIES	NU	Other	TCEQ SOP V2	98009	Field
PERCENT OF INDIVIDUALS AS HYBRIDS	%	Other	TCEQ SOP V2	98024	Field
TOTAL NUMBER OF INDIVIDUALS IN SAMPLE, FISH	NU	Other	TCEQ SOP V2	98023	Field
PERCENT OF INDIVIDUALS AS TOLERANTS, FISH	%	Other	TCEQ SOP V2	98016	Field
TOTAL NUMBER OF DARTER SPECIES	NU	Other	TCEQ SOP V2	98004	Field
Species Enumeration	#	Nekton	NA/Calculation	Various	Field

References:
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).

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

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 will make the basin-wide water quality monitoring plan its primary focus for the biennium.

The Performing Party will complete the following subtasks:

Monitoring Description—Based upon the input from the Cypress Creek Basin Steering Committee and through the coordinated monitoring process, a minimum of eight routine stations will be monitored quarterly for field parameters, flow (where applicable), bacteria, and conventional water chemistry by the Performing Party in FY 2026. Field parameters and flow (when possible) will be collected at a minimum of two additional stations per quarter. Diel studies consisting of pH, dissolved oxygen, conductivity, and temperature, along with instantaneous flow measurements (when possible) and field observations will be conducted four times per year at a minimum of two stations. Biological monitoring will be conducted at a minimum of one station in FY 2026. Specific locations, parameters, and sampling frequencies for FY 2026 are provided in the basin-wide QAPP for FY2026-2027.

In FY 2027, a similar monitoring effort is anticipated. Changes to the monitoring schedule will be made after considering input from the Cypress Creek Basin Steering Committee, and through the coordinated monitoring process. The specific locations, parameters, and sampling frequencies for FY 2027 will be provided in the Cypress Creek Basin QAPP Appendix B monitoring schedule.

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—December 15, 2025; March 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 and December 15, 2026; March 15 and June 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 NETMWD coordinates closely with the TCEQ and other participants to ensure a comprehensive water monitoring strategy within the watershed.

During FY 2026, twelve routine stations will be monitored, and 24-hour diel monitoring will be performed at two stations. Aquatic life monitoring will be conducted at one station. The results from data collected at these monitoring stations will be submitted to the TCEQ for inclusion in the SWQMIS database.

The following changes have been made to the FY 2026 monitoring schedule. These changes are a result of concerns or requests made by Cypress Creek Basin steering committee members and/or monitoring entities.

1) Add Aquatic Life Monitoring in Segment 0401A Harrison Bayou at station 22543. Conduct quarterly routine monitoring at 22543 and discontinue chlorophyll *a* analysis.

2) Discontinue routine field samples in Segment 0402B Hughes Creek at station 22321 since there are enough data for the assessment and DO readings have met the criteria.

3) Discontinue routine field samples in Segment 0402E Kelly Creek at station 16934 since there are enough data for the assessment.

4) Discontinue routine sampling in Segment 0404 Big Cypress Creek at station 10310 due to budget constraints and since TCEQ Region 5 is sampling in the same assessment unit.

5) Discontinue Aquatic Life Monitoring in Segment 0404 Big Cypress Creek at station 22423 since four events have been completed.

6) Discontinue chlorophyll *a* analysis in Segment 0404 Big Cypress Creek at station 16458 due to budget constraints and since TCEQ Region 5 is collecting the parameter in the same assessment unit.

7) Discontinue chlorophyll *a* analysis in Segment 0404B Tankersley Creek at station 10261 due to budget constraints and since chlorophyll meets its screening level.

8) Discontinue chlorophyll *a* analysis in Segment 0404C Hart Creek at station 10266 due to budget

constraints and since chlorophyll meets its screening level.

9) Discontinue routine sampling in Segment 0404E Dry Creek at station 10275 due to budget constraints.

10) Discontinue routine sampling in Segment 0404F Sparks Branch at station 10276 due to budget constraints.

11) Discontinue chlorophyll *a* analysis in Segment 0407 James' Bayou at station 14976 due to budget constraints and since chlorophyll meets its screening level.

12) Add routine field samples and flow in Segment 0407B Frazier Creek at station 10259 to address the DO grab concern.

13) Discontinue routine sampling in Segment 0409A Lilly Creek at station 20153 due to budget constraints.

14) Discontinue routine sampling in Segment 0409B South Lilly Creek at station 17954 due to budget constraints.

Biased to Season Monitoring

Diel monitoring will be conducted four times throughout the year. Diel monitoring includes quarterly sampling on Big Cypress Creek at Backwater Jacks at station 22422 and in James' Bayou at station 10321. Flow will be measured at all wadable stream stations or will be obtained from a nearby USGS gaging station.

Aquatic Life Monitoring will be conducted once during the non-critical period and once during the critical period in FY 2026 in Harrison Bayou at station 22543. The station is located in the Caddo Lake National Wildlife Refuge. Habitat assessment, benthic macroinvertebrates, and nekton will be assessed. Field parameters, flow, and diel data will be obtained during the monitoring events.

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 measurement during routine visits.

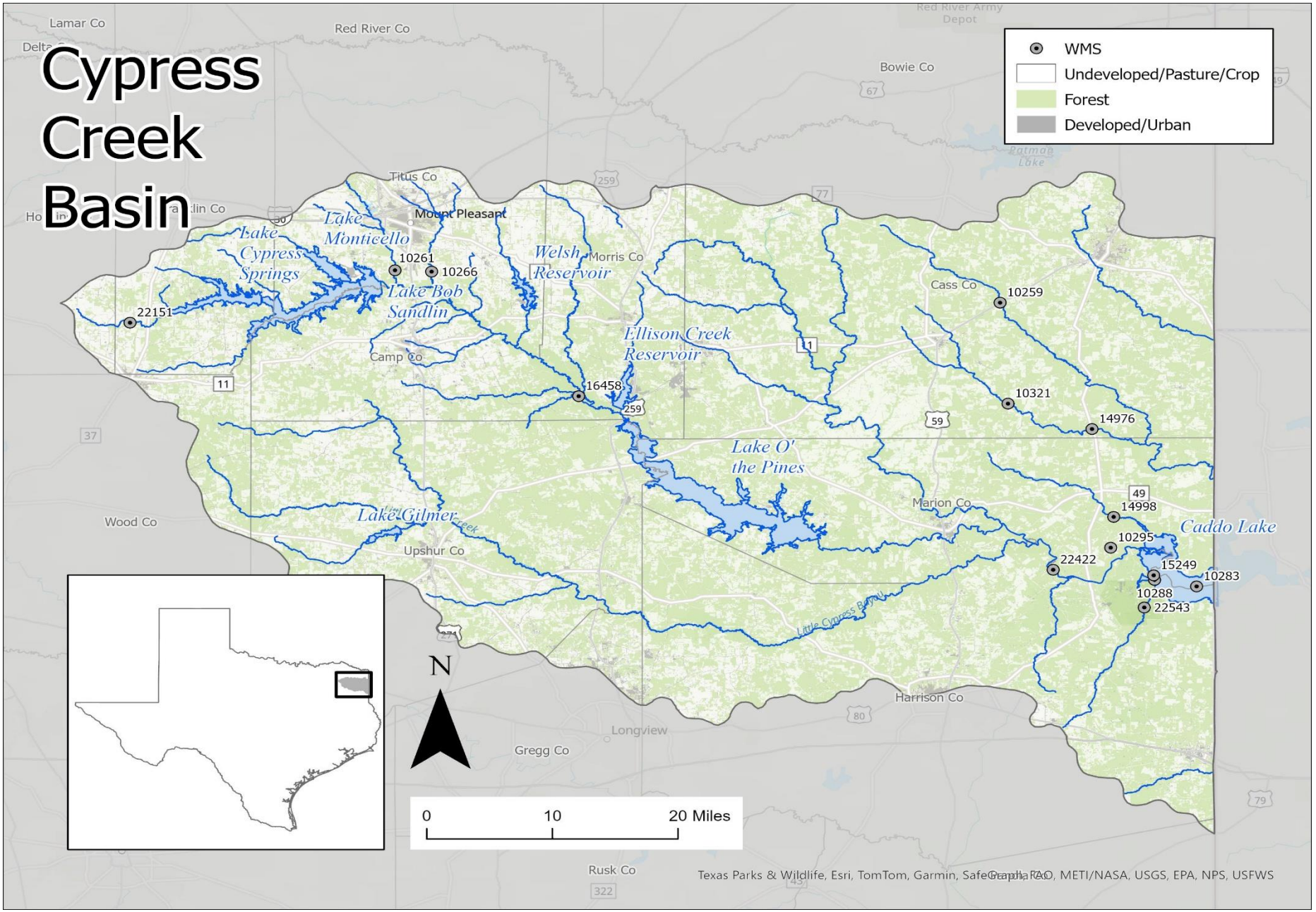
Monitoring Sites for FY 2026

Site Description	Station ID	Waterbody ID	Basin	Region	SE	CE	MT	Field	Conv	Bacteria	Flow	24 hr DO	Aq.Habitat	Benthic	Nekton	Comments
CADDO LAKE IN GOOSE PRAIRIE SOUTH OF STAR DITCH 500 M SOUTHEAST OF END OF FM 2198	10288	0401	04	05	NT	WM	RT	4	4	4						
CADDO LAKE MID LAKE 1.8 KM SOUTH OF END OF FM 727 1.9 KM NORTHWEST OF COLLIERS LAUNCH CAMS 707	10283	0401	04	05	NT	WM	RT	4	4	4						
CADDO LAKE NEAR SHORE AT END OF FM 2198 AT DWIGHT SHELLMANS PROPERTY SE OF UNCERTAIN	15249	0401	04	05	NT	WM	RT	4	4	4						
HARRISON BAYOU AT AVENUE Q EAST OF KARNACK	22543	0401A	04	05	NT	WM	RT	4	4	4	4					Flow measured when wadable; No chl.
HARRISON BAYOU AT AVENUE Q EAST OF KARNACK	22543	0401A	04	05	NT	WM	BS	2			2	2	2	2	2	
KITCHEN CREEK AT MARION CR3416 APPROXIMATELY 10 MI E. OF JEFFERSON AND 2.5 MI S OF INTERSECTION OF CR3416 AND SH49 EAST OF SMITHLAND	14998	0401B	04	05	NT	WM	RT	4			4					
BIG CYPRESS CREEK AT SH 43 NORTH OF KARNACK	10295	0402	04	05	NT	WM	RT	4	4	4	4					
BIG CYPRESS BAYOU IMMEDIATELY UPSTREAM OF BACKWATER JACKS RV PARK BOAT RAMP AT END OF LONGS CAMP ROAD NORTHWEST OF KARNACK	22422	0402	04	05	NT	WM	BS	4			4	4				
BIG CYPRESS CREEK IMMEDIATELY DOWNSTREAM OF CONFL. WITH GREASY CREEK APPROX 6.4KM SW OF LONE STAR	16458	0404	04	05	NT	WM	RT	4	4	4	4					No chl.
TANKERSLEY CREEK AT FM3417 5.7 KM SOUTH OF MOUNT PLEASANT	10261	0404B	04	05	NT	WM	RT	4	4	4	4					No chl.
HART CREEK AT TITUS COUNTY ROAD SE 12 3.8 KM UPSTREAM OF BIG CYPRESS CREEK CONFLUENCE SOUTH OF MOUNT PLEASANT	10266	0404C	04	05	NT	WM	RT	4	4	4	4					No chl.
BIG CYPRESS CREEK AT CR SW 3170 IN FRANKLIN COUNTY 7.93 KILOMETERS NORTH OF WINNSBORO	22151	0405A	04	05	NT	WM	RT	4	4	4	4					
JIMS BAYOU AT SH43 APPROXIMATELY 12 MI NE OF JEFFERSON AND 1.0 MI SOUTH OF KILDARE JUNCTION ON SH43	14976	0407	04	05	NT	WM	RT	4	4	4	4					No chl.
JAMES BAYOU AT CR 1775 1.6 MI SW OF KILDARE	10321	0407	04	05	NT	WM	BS	4			4	4				
FRAZIER CREEK AT US59 NE OF LINDEN	10259	0407B	04	05	NT	WM	RT	4			4					

Appendix C: Station Location Maps

Station Location Maps

Maps of stations monitored by the NETMWD are provided below. The maps were generated by WMS. 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 Randy Rushin at 903-439-4741.


Cypress Creek Basin
WMS
Undeveloped/Pasture/Crop
Forest
Developed/Urban
Lamar Co
Red River Co
Red River Army Depot
Bowie Co
Titus Co
Mount Pleasant
Lake Monticello
Lake Cypress Springs
Lake Bob Sandlin
Welsh Reservoir
Morris Co
Cass Co
Camp Co
Ellison Creek Reservoir
Lake O' the Pines
Marion Co
Caddo Lake
Wood Co
Upshur Co
Lake Gilmer
Harrison Co
Longview
Gregg Co
Rusk Co
Little Cypress Bayou
10261
10266
22151
16458
10259
10321
14976
14998
10295
22422
15249
10283
10288
22543
N
0
10
20 Miles
Texas Parks & Wildlife, Esri, TomTom, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS, USFWS

Appendix D: Field Data Sheets

Water Monitoring Solutions

water-monitor.com

Basin:
FY:
QTR:

Stream Field Form

Station ID:		Date:	Time:
Station Location:			
Sample(s) Collected By:			
Days Since Last Rain:	Total Rainfall - 7 Days Inclusive Prior to Sampling (Inches):		

Stream Type:	Present Weather:	Wind Intensity	Wind Direction		Aesthetics:
perennial	Clear	Calm	N	S	Wilderness
intermittent w/ perennial pools	Partly Cloudy	Slight	E	W	Natural
	Cloudy	Moderate	NE	SE	Common
intermittent	Rain	Strong	NW	SW	Offensive

Flow (cfs):	Flow Severity:		Water Odor:		Water Color:		Water Clarity:	
	No Flow	Flood	Sewage	Oily/ Chemical	Brown	Red	Poor	Good
Flow Method:	Low Flow	High	Rotten Eggs	Musky	Green	Black	Fair	Excellent
	Normal	Dry	Fishy	None Other	Clear	Other		

Flow Est. cfs	Water Temp °C	DO % sat	DO mg/L	Sp. Cond µS/cm	pH s.u.	Secchi m	Air Temp °C	Sample Depth m	Water Column Depth m

Observations: (Pools, debris in water, signs of eutrophication, observed uses, land use, etc.):

	Field		Conventionals		*E. coli*		

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Water Monitoring Solutions

water-monitor.com

Basin:
FY:
QTR:

Reservoir Field Form

Station ID:			Date:			Time:	
Station Location:							
Sample(s) Collected By:							
Days Since Last Rain:		Total Rainfall - 7 Days Inclusive Prior to Sampling (Inches):					

Water Level:	Present Weather:	Wind Intensity	Wind Direction		Water Surface
Below Normal	Clear	Calm	N	S	Calm
Normal	Partly Cloudy	Slight	E	W	Ripple
Above Normal	Cloudy	Moderate	NE	SE	Waves
	Rain	Strong	NW	SW	Whitecap

Reservoir Stage (ft.)	Reservoir % Full	Sediment Odor:		Water Odor:		Water Color:		Water Clarity:	
		None	Sewage	Sewage	Oily / Chemical	Brown	Red	Poor	Good
		Musky	Other:	Rotten Eggs	Musky	Green	Black	Fair	Excellent
		Fishy		Fishy	None / Other	Clear	Other		

Sample Depth m	Water Temp °C	DO % sat	DO mg/L	Sp. Cond µS/cm	pH
0.3					
1.0					
2.0					
3.0					
4.0					
5.0					
6.0					
7.0					
8.0					
9.0					
10.0					
11.0					
12.0					
13.0					
		Field		Conventionals	

Total Depth (m):	Secchi (m)	Air Temp °C	Photos Taken

% Cloud Coverage	% Aquatic Plant Coverage

Observations:

	E. coli		

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Discharge Measurement Summary

Site name	Tank
Site number	10261
Operator(s)	Rushin
File name	20240207_10261.ft
Comment	

Start time	2/7/2024 12:08 PM
End time	2/7/2024 12:25 PM
Start location latitude	-
Start location longitude	-
Calculations engine	FlowTracker2

Sensor type	Top Setting
Handheld serial number	FT2H2103024
Probe serial number	FT2P2052014
Probe firmware	1.30
Handheld software	1.7

# Stations	Avg interval (s)	Total discharge (ft³/s)
22	40	24.3360

Total width (ft)	Total area (ft²)	Wetted Perimeter (ft)
18.100	18.6200	18.859

Mean SNR (dB)	Mean depth (ft)	Mean velocity (ft/s)
43	1.029	1.3070

Mean temp (°F)	Max depth (ft)	Max velocity (ft/s)
54.266	1.600	1.8350

Discharge Uncertainty		
Category	**ISO**	**IVE**
Accuracy	1.0%	1.0%
Depth	0.1%	2.1%
Velocity	0.5%	1.6%
Width	0.1%	0.1%
Method	1.7%	
# Stations	2.3%	
Overall	**3.1%**	**2.8%**

Discharge equation	Mid Section
Discharge uncertainty	IVE
Discharge reference	Measured

Data Collection Settings	
Salinity	0.000 PSS-78
Temperature	-
Sound speed	-
Mounting correction	0.000 %

Summary overview

No changes were made to this file
Quality control warnings


Discharge chart
Station discharge (ft³/s)
0
0.2
0.4
0.6
0.8
26 24 22 20 18 16 14 12 10 8 6 4 2
ft
Velocity chart
Velocity (ft/s)
0
0.1
0.2
0.3
0.4
26 24 22 20 18 16 14 12 10 8 6 4 2
ft
Depth chart
Depth (ft)
0
0.5
1.0
1.5
2.0
26 24 22 20 18 16 14 12 10 8 6 4 2
ft

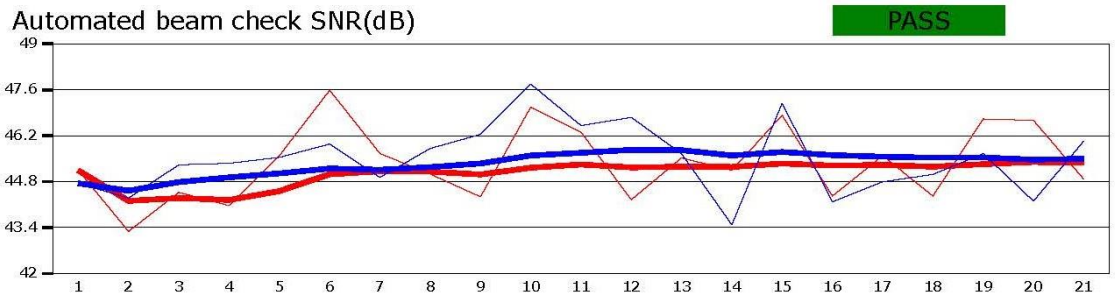
Measurement results

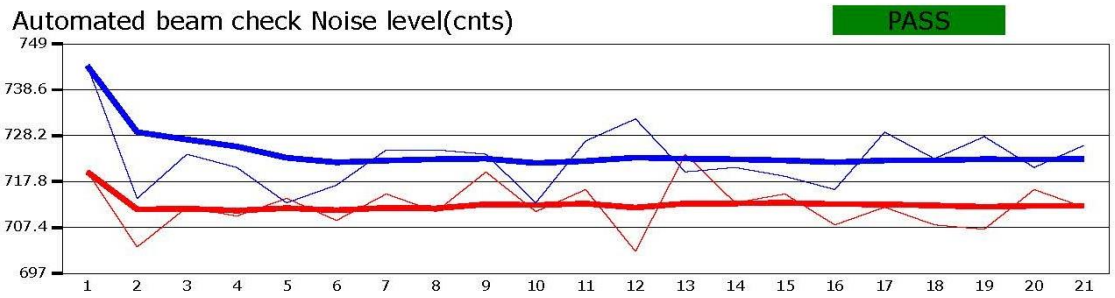
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Samples	Velocity (ft/s)	Correction	Mean Velocity (ft/s)	Area (ft^2)	Flow (ft^3/s)	%Q	
0	8:38 AM	1.000	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.1215	0.0000	0.0000	0.00	✓
1	8:39 AM	3.000	0.6	0.400	0.6000	0.240	40	0.1215	1.0000	0.1215	0.8000	0.0972	0.86	✓
2	8:40 AM	5.000	0.6	1.100	0.6000	0.660	40	0.2070	1.0000	0.2070	2.2000	0.4554	4.03	✓
3	8:41 AM	7.000	0.6	1.200	0.6000	0.720	40	0.3640	1.0000	0.3640	2.4000	0.8735	7.73	✓
4	8:42 AM	9.000	0.6	1.100	0.6000	0.660	40	0.3934	1.0000	0.3934	1.6500	0.6491	5.75	✓
5	8:42 AM	10.000	0.6	1.000	0.6000	0.600	40	0.4695	1.0000	0.4695	1.0000	0.4695	4.16	✓
6	8:43 AM	11.000	0.6	1.100	0.6000	0.660	40	0.4740	1.0000	0.4740	1.1000	0.5214	4.61	✓
7	8:44 AM	12.000	0.6	1.100	0.6000	0.660	40	0.4117	1.0000	0.4117	1.1000	0.4529	4.01	✓
8	8:45 AM	13.000	0.6	1.100	0.6000	0.660	40	0.3921	1.0000	0.3921	1.1000	0.4313	3.82	✓
9	8:46 AM	14.000	0.6	1.300	0.6000	0.780	40	0.4434	1.0000	0.4434	1.3000	0.5764	5.10	✓
10	8:47 AM	15.000	0.6	1.300	0.6000	0.780	40	0.3653	1.0000	0.3653	1.3000	0.4749	4.20	✓
11	8:47 AM	16.000	0.6	1.500	0.6000	0.900	40	0.3748	1.0000	0.3748	1.5000	0.5621	4.98	✓
12	8:48 AM	17.000	0.6	1.650	0.6000	0.990	40	0.3731	1.0000	0.3731	1.6500	0.6156	5.45	✓
13	8:49 AM	18.000	0.6	1.700	0.6000	1.020	40	0.4061	1.0000	0.4061	1.7000	0.6904	6.11	✓
14	8:50 AM	19.000	0.6	1.700	0.6000	1.020	40	0.4120	1.0000	0.4120	1.7000	0.7003	6.20	✓
15	8:50 AM	20.000	0.6	1.850	0.6000	1.110	40	0.4268	1.0000	0.4268	1.8500	0.7895	6.99	✓
16	8:51 AM	21.000	0.6	1.900	0.6000	1.140	40	0.4207	1.0000	0.4207	1.9000	0.7994	7.08	✓
17	8:52 AM	22.000	0.6	1.800	0.6000	1.080	40	0.4395	1.0000	0.4395	1.8000	0.7911	7.00	✓
18	8:53 AM	23.000	0.6	1.700	0.6000	1.020	40	0.3415	1.0000	0.3415	1.7000	0.5806	5.14	✓
19	8:54 AM	24.000	0.6	1.400	0.6000	0.840	40	0.2919	1.0000	0.2919	1.4000	0.4086	3.62	✓
20	8:55 AM	25.000	0.6	1.000	0.6000	0.600	40	0.2312	1.0000	0.2312	1.5500	0.3584	3.17	✓
21	8:56 AM	27.100	None	0.000	0.0000	0.000	0	0.0000	1.0000	0.2312	0.0000	0.0000	0.00	✓

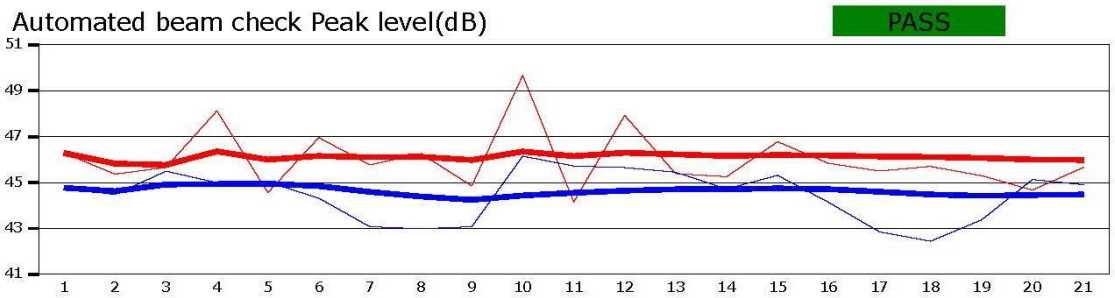
Quality control warnings

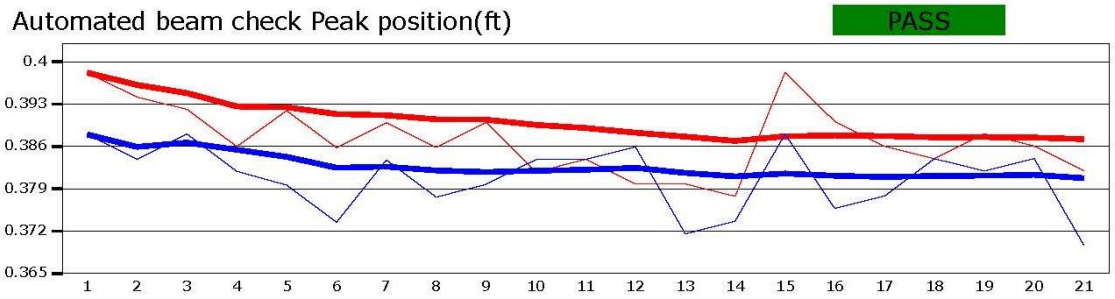
St#	Time	Location (ft)	Method	Depth (ft)	%Depth	Measured Depth (ft)	Warnings
21	8:56 AM	27.100	None	0.000	0.0000	0.000	Stn Spacing > QC,Water Depth > QC

Automated beam check Start time 3/29/2021 8:38:24 AM









Automated beam check Quality control warnings

No quality control warnings

Water Monitoring Solutions.
water-monitor.com

Fish Collection Data Sheet

Date		Time		Segment #	
Station ID		Station Description			
County		Lat/Long			
Flow (cfs)	Water Temp ºC	DO % sat	DO mg/L	Sp. Cond µS/cm	pH s.u.
Flow Method	Secchi m	Air Temp ºC	Avg Depth m	Min depth m	Max depth m
Permittee Name			Permit #		
Collectors					
Backpack Electrofisher					
Start Time		End Time		Voltage (v)	
Pulse width (msec)		Duration (sec)		Frequency (pps)	
Comments					
Seine					
Start Time		End Time		No. hauls	
Seine Length (ft.)		Mesh Size (in.)		Duration of hauls	
Comments					
Weather					
Habitat Type(s) sampled					
Observations					

P.O. Box 1132 Sulphur Springs, TX 75483 903-439-4741 www.water-monitor.com

Water Monitoring Solutions
water-monitor.com

Collectors:

ELECTROSHOCK / SEINE

County	Station #	Location:			Start Time	End Time
Common Name *or* Scientific Name	Length (mm) for 2 vouchers	Fish Count	Total # Collected	# Released	# Live Take / Vouchers	# Incidental Mortalities / Anomalies
Permittee	Signature		Permit #			Date

Water Monitoring Solutions
water-monitor.com

Benthic Collection Data Sheet

Date		Start Time		End Time	
Station ID		Station Description			
County		Segment #			
Collectors					
Sample Tracking Log Number					
Benthic Sampler Type (circle)	Surber	Ekman	Kicknet	Petersen	Hester-Dendy
Kicknet - area kicked (m^2)			Mesh size (cm)		
Dip-net - area swept (m^2)			Kicknet - minutes kicked		
Shallowest Depth (m)			Deepest Depth (m)		
Habitat Type(s) sampled					
Undercut bank (%)			Overhanging brush (%)		
Gravel substrate (%)			Sand substrate (%)		
Soft bottom (%)			Bedrock (%)		
Macrophyte bed (%)			Snags and brush (%)		
Observations					

P.O. Box 1132 Sulphur Springs, TX 75483 903-439-4741 www.water-monitor.com

Part I - Stream Physical Characteristics Worksheet

Observers:		Date:		Time:	
Weather conditions:					
Stream:				Segment ID:	
Site Location:				Reach length:	
Observed stream uses:					
Stream type (circle one):	perennial	or	intermittent with perennial pools		
Stream bends:	No. well defined		No. moderately defined		No . poorly defined
Aesthetics (circle one):	(1) wilderness	(2) natural	(3) common	(4) offensive	
Channel obstructions or modifications:				No. riffles	
Channel flow status (circle one):	high	moderate	low	no flow	

Riparian vegetation (%	Left bank	Right bank	Maximum pool depth:		Maximum pool width:
Trees			Notes:		
Shrubs					
Grasses or forbs					
Cultivated fields					
Other					

Site map:

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Part I - Stream Physical Characteristics Worksheet (continued)

Date:		Stream name:																							
Location of transect		Stream width (m)	Left bank slope (°)	LB erosion potential (%)	Thalweg depth:		Stream Depths (m) at Points Across Transect											RB erosion potential (%)	Right Bank Slope (°)					
		Habitat type (circle one)		Dominant substrate type			Dominant types riparian vegetation:											% Gravel or larger	Tree canopy (%)					
		Riffle	Run				Left bank:												Total					
		Glide	Pool				Right bank:												CL					
Macrophytes (circle one)		Algae (circle one)		Width of natural buffer (m)		Instream cover types												% Instream cover	CR					
Abundant	Commmon	Abundant	Commmon	LB	RB														LB					
Rare	Absent	Rare	Absent																RB					

Location of transect		Stream width (m)	Left bank slope (°)	LB erosion potential (%)	Thalweg depth:		Stream Depths (m) at Points Across Transect											RB erosion potential (%)	Right Bank Slope (°)					
		Habitat type (circle one)		Dominant substrate type			Dominant types riparian vegetation:											% Gravel or larger	Tree canopy (%)					
		Riffle	Run				Left bank:												Total					
		Glide	Pool				Right bank:												CL					
Macrophytes (circle one)		Algae (circle one)		Width of natural buffer (m)		Instream cover types												% Instream cover	CR					
Abundant	Commmon	Abundant	Commmon	LB	RB														LB					
Rare	Absent	Rare	Absent																RB					

Location of transect		Stream width (m)	Left bank slope (°)	LB erosion potential (%)	Thalweg depth:		Stream Depths (m) at Points Across Transect											RB erosion potential (%)	Right Bank Slope (°)					
		Habitat type (circle one)		Dominant substrate type			Dominant types riparian vegetation:											% Gravel or larger	Tree canopy (%)					
		Riffle	Run				Left bank:												Total					
		Glide	Pool				Right bank:												CL					
Macrophytes (circle one)		Algae (circle one)		Width of natural buffer (m)		Instream cover types												% Instream cover	CR					
Abundant	Commmon	Abundant	Commmon	LB	RB														LB					
Rare	Absent	Rare	Absent																RB					

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Part I - Stream Physical Characteristics Worksheet (continued)

Date:		Stream name:																					
Location of transect		Stream width (m)	Left bank slope (°)	LB erosion potential (%)	Thalweg depth:		Stream Depths (m) at Points Across Transect											RB erosion potential (%)	Right Bank Slope (°)				
		Habitat type (circle one)		Dominant substrate type			Dominant types riparian vegetation:											% Gravel or larger	Tree canopy (%)				
		Riffle	Run				Left bank:												Total				
		Glide	Pool				Right bank:												CL				
Macrophytes (circle one)		Algae (circle one)		Width of natural buffer (m)		Instream cover types												% Instream cover	CR				
Abundant	Commmon	Abundant	Commmon	LB	RB														LB				
Rare	Absent	Rare	Absent																RB				

Location of transect		Stream width (m)	Left bank slope (°)	LB erosion potential (%)	Thalweg depth:		Stream Depths (m) at Points Across Transect											RB erosion potential (%)	Right Bank Slope (°)				
		Habitat type (circle one)		Dominant substrate type			Dominant types riparian vegetation:											% Gravel or larger	Tree canopy (%)				
		Riffle	Run				Left bank:												Total				
		Glide	Pool				Right bank:												CL				
Macrophytes (circle one)		Algae (circle one)		Width of natural buffer (m)		Instream cover types												% Instream cover	CR				
Abundant	Commmon	Abundant	Commmon	LB	RB														LB				
Rare	Absent	Rare	Absent																RB				

Location of transect		Stream width (m)	Left bank slope (°)	LB erosion potential (%)	Thalweg depth:		Stream Depths (m) at Points Across Transect											RB erosion potential (%)	Right Bank Slope (°)				
		Habitat type (circle one)		Dominant substrate type			Dominant types riparian vegetation:											% Gravel or larger	Tree canopy (%)				
		Riffle	Run				Left bank:												Total				
		Glide	Pool				Right bank:												CL				
Macrophytes (circle one)		Algae (circle one)		Width of natural buffer (m)		Instream cover types												% Instream cover	CR				
Abundant	Commmon	Abundant	Commmon	LB	RB														LB				
Rare	Absent	Rare	Absent																RB				

TCEQ 20168-A (Rev. 07/18/2014)

TCEQ Fish Sample Tracking Log

Sample tracking log #:		TCEQ Station ID:		
Location description:				
Collector(s):				
Identifier(s):				
Dates				
Collected	Entered into Log	Transferred to EtOH	Identified	
Methods				
Seine hauls	Electrofish (secs.)	Gill net duration	Other	

Sample tracking log #:		TCEQ Station ID:		
Location description:				
Collector(s):				
Identifier(s):				
Dates				
Collected	Entered into Log	Transferred to EtOH	Identified	
Methods				
Seine hauls	Electrofish (secs.)	Gill net duration	Other	

Sample tracking log #:		TCEQ Station ID:		
Location description:				
Collector(s):				
Identifier(s):				
Dates				
Collected	Entered into Log	Transferred to EtOH	Identified	
Methods				
Seine hauls	Electrofish (secs.)	Gill net duration	Other	

Sample tracking log #:		TCEQ Station ID:		
Location description:				
Collector(s):				
Identifier(s):				
Dates				
Collected	Entered into Log	Transferred to EtOH	Identified	
Methods				
Seine hauls	Electrofish (secs.)	Gill net duration	Other	

TCEQ-20235 (rev. 07/18/2014)

TCEQ Benthic Macroinvertebrate Sample Tracking Log

Sample tracking log number:
Name of collector:
TCEQ Station ID:
Location description:
Date of collection:
Date entered in sample tracking log:
Date identification started:
Date identification completed:
Method of collection:

Sample tracking log number:
Name of collector:
TCEQ Station ID:
Location description:
Date of collection:
Date entered in sample tracking log:
Date identification started:
Date identification completed:
Method of collection:

Sample tracking log number:
Name of collector:
TCEQ Station ID:
Location description:
Date of collection:
Date entered in sample tracking log:
Date identification started:
Date identification completed:
Method of collection:

TCEQ-20231 (rev 7/18/2014)

TCEQ Fish Laboratory Bench Sheet	
Sample tracking log number:	
Name of identifier:	
Location of collection:	Method of collection:
Date of collection:	
Date entered in sample tracking log:	
Date identification/enumeration started:	
Date identification/enumeration completed:	

Scientific Name	Number of Individuals

TCEQ-20232 (rev. 07/18/2014)

TCEQ Benthic Macroinvertebrate Laboratory Bench Sheet	
Sample tracking log number:	
Name of identifier:	
Location of collection:	Method of collection:
Date of collection:	
Date entered in sample tracking log:	
Date identification/enumeration started:	
Date identification/enumeration completed:	

Scientific Name	Number of Individuals

TCEQ-20232 (rev. 7/18/2014)

Appendix E: Chain of Custody Forms

Environmental Laboratory Services
The Solution Lab

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

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

Phone: (512) 356-6022 or 1-800-776-5272
Fax: (512) 356-6021
https://els.lcra.org

Project:	NETMWD East	**Client:**	Northeast Texas Municipal Water District
Collector:		**Contact:**	
Event#:		**Phone:**	

Report To: Roy Darville
East Texas Baptist University
1 Tiger Drive
Biology Bldg.
Marshall, TX 75670

Lab ID#:

Client PO:

Invoice To: Robert Speight
Northeast Texas Municipal Water
P.O. Box 955
Hughes Springs, TX 75656

LAB USE ONLY	Sample ID *	Collected *		Matrix*	Container(s) Type/Preservative/Number *										Requested Analysis *											
		Date*	Time * HH:MM	AQ = Aqueous S = Solid T = Tissue DW =Drinking Water	COMPOSITE Y/N	FILTERED Y/N	250STERL	500APU	1LPU	125STERL	250PHSO4	250APU	250PHNO3	250PU	5310-ATOC	365.4AM	9223-A-30	445.0AM	350.1AM	2320-AM	200.7AM	2540-AMTSS	300.0AM-48	2340-AM	351.2AM	
1	15249			AQ			1	1	1		1		1	1	X	X	X	X	X	X	X	X	X	X	X	
2	15508			AQ					1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X	X	
3	10321			AQ					1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X	X	
4	14976			AQ					1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X	X	
5	10283			AQ					1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X	X	
6	10244			AQ					1	1	1	1	1	1	X	X	X	X	X	X	X	X	X	X	X	
7																										

Transfers	Relinquished By	Date/Time	Received By	Date/Time	Cooler Temp:				Client Special Instructions:
					#	T#	Obs.	Corr.	
1									
2					1				
3					2				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.

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 Source: _____

Date Submitted: _____

Tag_id Range: _____

Date Range: _____

□ 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 criteria in the Data Review Checklist.

Planning Agency Data Manager: _____ Date: _____

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

- Inconsistencies with 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 and send *Corrective Action Status Report* with the applicable Progress Report).

Dataset ____ contains data from FY__ QAPP Submitting Entity code __ and collecting entity __. This is field and lab data that was collected by the (collecting entity). Analyses were performed by the (lab name). The following tables explain discrepancies or missing data as well as calculated data loss.

Discrepancies or missing data for the listed tag ID:

Tag ID	Station ID	Date	Parameters	Type of Problem	Comment/PreCAPs/CAPs

Data Loss

Parameter	Missing Data points out of Total	Percent Data Loss for this Dataset	Parameter	Missing Data points out of Total	Percent Data Loss for this Dataset