Quality Assurance Project Plan
Trinity River Authority

5300 South Collins, Arlington, TX 76018
PO Box 60, Arlington, TX 76004

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 2024 to FY 2025

Questions concerning this QAPP should be directed to:
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A1 Approval Page

Texas Commission on Environmental Quality

Water Quality Planning Division

9/5/2023
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Jason Godeaux, Manager Date
Water Quality Monitoring and Assessment Section

8/31/2023
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Sarah Whitley, Team Leader Date
Water Quality Standards and Clean Rivers Program

8/31/2023
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Grant Bassett, Date
Project Quality Assurance Specialist
Clean Rivers Program

8/31/2023
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Kiran Freeman, Project Manager Date
Clean Rivers Program

_____08/31/2023____
Cathy Anderson, Team Leader Date
Data Management and Analysis

Monitoring Division

09/12/2023
_____
D. Jody Koehler Date TCEQ
Quality Assurance Manager

09/12/2023
_____
Jason Natho Date
Acting Lead CRP Quality Assurance Specialist

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List of Acronyms

ALM	Aquatic Life Monitoring
ALS	ALS Laboratory Group – Environmental Services Division
AQL	Acceptable Quality Limit
AR	City of Arlington
AU	Assessment Unit
AWRL	Ambient Water Reporting Limit
BLOB	Binary Large Object File
BMP	Best Management Practices
BS	Biased to Season Monitoring
CAP	Corrective Action Plan
CE	Collecting Entity
CFR	Code of Federal Regulations
CMS	Coordinated Monitoring Schedule
COC	Chain of Custody
CRP	Clean Rivers Program
CSV	Comma Separated Values
DA	City of Dallas Lakes Monitoring Group
DF	Dallas/Fort Worth International Airport Environmental Affairs Department
DFW Airport EAD	Dallas/Fort Worth International Airport Environmental Affairs Department
DM	Data Manager
DMRG	Surface Water Quality Monitoring Data Management Reference Guide
DM&A	Data Management and Analysis
DO	Dissolved Oxygen
DT	City of Dallas Trinity Monitoring Group
DUP	Duplicate
EPA	United States Environmental Protection Agency
FR	City of Frisco
FW	City of Fort Worth
FY	Fiscal Year
GIS	Geographical Information System
GMT	Greenwich Mean Time
GP	City of Grand Prairie
GPS	Global Positioning System
GT/LT	Greater Than/Less Than
IBWC	International Boundary and Water Commission
ID	Identification
IR	City of Irving
IT	Information Technology
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LIMS	Laboratory Information Management System
LL	Trinity River Authority Lake Livingston Project
LLP	Trinity River Authority Lake Livingston Project
LOD	Limit of Detection
LOQ	Limit of Quantitation
MQL	Method Quantitation Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MT	Monitoring Type
NELAC	National Environmental Lab Accreditation Conference
NELAP	National Environmental Lab Accreditation Program
NM	North Texas Municipal Water District
NOAA	National Oceanic and Atmospheric Administration
NTMWD	North Texas Municipal Water District

OPP	Operating Policy and Procedure
PALS	Dallas Water Utilities Pretreatment and Laboratory Services
PDF	Portable Document Format
PM	Project/Program Manager
PN	City of Plano
QA	Quality Assurance
QM	Quality Manual
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QAS	Quality Assurance Specialist
QC	Quality Control
QMP	Quality Management Plan
RL	Reporting Limit
RPD	Relative Percent Difference
RS&C	Trinity River Authority Regulatory Services and Compliance
RT	Routine Monitoring
SE	Submitting Entity
SLOC	Station Location
SOP	Standard Operating Procedure
SQL	Structured Query Language
SWQM	Surface Water Quality Monitoring
SWQMIS	Surface Water Quality Monitoring Information System
TCEQ	Texas Commission on Environmental Quality
TD	Tarrant Regional Water District
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TNI	The NELAC Institute
TOC	Total Organic Carbon
TR	Trinity River Authority
TRA	Trinity River Authority
TRWD	Tarrant Regional Water District
TSWQS	Texas Surface Water Quality Standards
TWDB	Texas Water Development Board
UAA	Use Attainability Analysis
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
UTRWD	Upper Trinity Regional Water District
UW	Upper Trinity Regional Water District
VOA	Volatile Organic Analytes
WBPA	Within-Basin Participating Agency
WMS	Water Monitoring Solutions, Inc.

A3 Distribution List

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The TRA 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 TRA 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.

A4 PROJECT/TASK ORGANIZATION

Description of Responsibilities

TCEQ

Sarah Whitley
Team Leader, Water Quality Standards and Clean Rivers Program
Responsible for Texas Commission on Environmental Quality (TCEQ) activities supporting the development and implementation of the Texas Clean Rivers Program (CRP). Responsible for verifying that the TCEQ Quality Management Plan (QMP) is followed by CRP staff. Supervises TCEQ CRP staff. Reviews and responds to any deficiencies, corrective actions, or findings related to the area of responsibility. Oversees the development of Quality Assurance (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.

Jason Natho
Acting 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 and project manager in developing and implementing 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.

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

Cathy Anderson
Team Leader, Data Management and Analysis (DM&A) 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, DM&A Team
Responsible for coordination and tracking of CRP data sets from initial submittal through CRP Project Manager review and approval. Ensures that data are reported following instructions in the Data Management Reference Guide, July 2019 or most current version (DMRG). Runs automated data validation checks in the Surface Water Quality Management Information System (SWQMIS) and coordinates data verification and error correction with CRP Project Managers. Generates SWQMIS summary reports to assist CRP Project Managers' 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 code(s), collecting entity code(s), and monitoring type 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).

Grant Bassett
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.

TRINITY RIVER AUTHORITY

Angela Kilpatrick
TRA 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 or oversees a qualified TRA CRP staff member who may conduct monitoring systems audits to ensure QAPPs are followed by WBPAs and that projects are producing data of known quality, issues written reports, and follows through on findings. Ensures that subparticipants are qualified to perform contracted work. Ensures CRP project managers and/or QA Specialists are notified of deficiencies and corrective actions, and that issues are resolved. Responsible for coordinating and directing the implementation of the QA program. Responsible for writing and maintaining the QAPP and monitoring its implementation. Responsible for maintaining records of QAPP distribution, including appendices and amendments. Responsible for maintaining written records of sub-tier commitment to requirements specified in this QAPP. Responsible for identifying, receiving, and maintaining project QA records. Responsible for coordinating with the TCEQ CRP PM and/or CRP Project QAS to resolve difficult QA-related issues. Coordinates and monitors deficiencies and corrective action in cooperation with the TRA Quality Assurance Officer. Coordinates the research and review of technical QA material and data related to water quality monitoring system design and analytical techniques. Ensures that TRA field staff is properly trained and that training records are maintained.

Hong Wu
TRA Quality Assurance Officer
Responsible for coordinating with the TRA PM and may be responsible for coordinating with the TCEQ CRP Project QAS to resolve difficult QA-related issues. Notifies the TRA Project Manager of particular circumstances which may adversely affect the quality of data. Coordinates and maintains records of data verification and validation under the direction of the TRA Project Manager. Responsible for coordinating the implementation of the QA program under the direction of the TRA Project Manager. Coordinates and monitors deficiencies and corrective action under the direction of the TRA Project Manager. Responsible for validating that data collected are acceptable for reporting to the TCEQ. Responsible for ensuring that field and lab data are properly reviewed and verified and oversees the TRA Data Manager in conducting these duties. Converts TRA RS&C LIMS data for TRA and WBPAs into the data submittal template or oversees the work of the TRA Data Manager in conducting these duties. Oversees the work of the TRA Data Manager for field and lab data review and verification. Responsible for the transfer of basin quality assured water quality data to the TCEQ in a format compatible with SWQMIS. Maintains quality-assured data on TRA internet sites.

Charles Pratt
TRA Data Manager
Responsible for TRA CRP field data entry and conversion of TRA RS&C LIMS data for TRA and WBPAs into the data submittal template under the supervision of the TRA QAO. Works under the direction of the TRA Quality Assurance Officer to ensure that field and lab data are properly reviewed and verified. Works under the direction of the TRA Quality Assurance Officer to coordinate and maintain records of data verification and validation.

Anthony Rust
TRA Field Team Leader
Responsible for ensuring that field samples and measurements are collected and recorded according to methodologies detailed in this QAPP. Field team leaders will be instructed on appropriate sampling methodologies, and will ensure that such methodologies are followed. They will have primary responsibility for initiating corrective actions in the field in support of data completeness goals of 90%. Field team leaders will ensure proper use of field notebooks, field electronic data entry equipment, proper calibration of equipment, and that chain of custody forms are correctly completed and delivered to the laboratory with analytical samples. Responsible for ensuring that the

electronic field data geodatabase schema is maintained and that all electronically collected field data are compliant with TCEQ requirements. Responsible for ensuring that all electronically collected field data are properly formatted for delivery to the TRA Quality Assurance Officer. Responsible for documenting any nonconforming field activities and submitting the information to the TRA Quality Assurance Officer and TRA Project Manager.

WITHIN-BASIN PARTICIPATING AGENCIES (WBPA)

Field Team Leaders

To Remain Unnamed - TRA LLP, Tarrant Regional Water District, Upper Trinity Regional Water District, City of Arlington, City of Dallas (Collecting Entity Code DA), City of Fort Worth, City of Grand Prairie, City of Irving, City of Dallas (Collecting Entity Code DT), City of Plano, City of Frisco, North Texas Municipal Water District, DFW Airport EAD

Field team leaders are responsible for ensuring that field samples and measurements are collected and recorded according to methodologies detailed in this QAPP. Field team leaders will be instructed on appropriate sampling methodologies, and will ensure that such methodologies are followed. They will have primary responsibility for initiating corrective actions in the field in support of data completeness goals of 90%. Field team leaders will ensure proper use of field notebooks, proper inspection, testing, and calibration of equipment, and that chain of custody forms are correctly completed and delivered to the laboratory with analytical samples. Field team leaders will be responsible for documenting any nonconforming field activities and submitting the information to the WBPA Project Manager and/or WBPA QAO.

Field Team Members

To Remain Unnamed - TRA LLP, Tarrant Regional Water District, Upper Trinity Regional Water District, City of Arlington, City of Dallas (Collecting Entity Code DA), City of Fort Worth, City of Grand Prairie, City of Irving, City of Dallas (Collecting Entity Code DT), City of Plano, City of Frisco, North Texas Municipal Water District, DFW Airport EAD

Field team members will work under the direction of field team leaders as necessary to ensure field samples and measurements are collected and recorded according to methodologies detailed in this QAPP.

Project Managers

Mike Knight, TRA LLP
Mark Ernst, Tarrant Regional Water District
Jason Pierce, Upper Trinity Regional Water District
Brigette Gibson, City of Arlington
Jessica Donovan, City of Dallas (Collecting Entity Code DA)
Nixalis Benitez, City of Fort Worth
Jody Cason, City of Grand Prairie
Jeffrey Shiflet, City of Irving
Kevin Hill, City of Dallas (Collecting Entity Code DT)
Keith White, City of Plano
Sean Aucoin, City of Frisco
Kristen Suprobo, North Texas Municipal Water District
Jamie Hopper, DFW Airport EAD

The project managers are responsible for all CRP-related activities conducted by their respective agencies. The project managers will oversee field teams, assuring that all are properly trained by either TRA staff or trained WBPA personnel and that CRP-related sampling activities are conducted in manners consistent with procedures detailed in this QAPP. The project managers also supervise submittal of water quality samples to contract laboratories as appropriate and will be responsible for confirming that requested analyses are carried out. Ensures that field staff are properly trained and that training records are maintained in accordance with their entity's policies and/or are sent to the TRA QAO. The project managers are responsible for ensuring that the TRA QAO and/or PM are informed of any nonconformances and for working with the TRA QAO and/or PM to implement corrective actions. Project managers are responsible for notifying the TRA QAO and PM of any monitoring or laboratory changes to ensure that QAPP amendments are completed in a timely fashion.

Quality Assurance Officers

Sheryl Hanks, TRA LLP
Jennifer Owens, Tarrant Regional Water District
Dylan Tissue, City of Arlington
Jessica Donovan, City of Dallas (Collecting Entity Code DA)
Kayla Miller, City of Fort Worth
Jody Cason, Acting City of Grand Prairie
Johnathon Allen, City of Irving
Andrew Wallace, City of Dallas (Collecting Entity Code DT)
Keith White, City of Plano
Sean Aucoin, City of Frisco
Katie McElroy, North Texas Municipal Water District
Michelle Carte, Upper Trinity Regional Water District
Asciatu Whiteside, DFW Airport EAD

The quality assurance officers are responsible for ensuring their respective agencies meet all quality control and quality assurance requirements as specified in this QAPP. Responsible for coordinating with the TRA DM and QAO to resolve QA related issues. Works under the guidance of the WBPA Project Manager to notify the TRA Project Manager and/or Quality Assurance Officer of particular circumstances which may adversely affect the quality of data including nonconformances. Ensures that field staff is properly trained and that training records are transmitted to the TRA Project Manager. Responsible for ensuring that data submittals to the TRA Data Manager are complete and verified.

Laboratory Managers/Supervisors

Jennifer Whitaker, TRA RS&C Laboratory
Mike Knight, TRA LLP Laboratory
Ann Lawson, City of Arlington Laboratory
Carlos Castro, Eurofins Xenco, LLC - Dallas
Stephanie Coch, Eurofins Xenco, LLC - Houston
Kelly Harden, North Texas Municipal Water District
Randy Rushin, Water Monitoring Solutions, Inc.
Javier Robles, ALS Laboratory Group – Environmental Services Division
Yi Zhang – Interim Dallas Water Utilities PALS Analytical Laboratory

The laboratory managers/supervisors will oversee all analytical work performed at their respective laboratories to assure that proper and appropriate clean analytical techniques are utilized, all QA/QC requirements are met, documentation is complete and adequately maintained, and results are reported accurately. When quality assurance issues arise or deviations from this QAPP or related SOPs occur in the laboratory, the laboratory managers will be responsible for initiating corrective actions and for notifying the TRA QAO of any such issues either by email or phone call. The laboratory managers will also maintain the laboratory's QA records and analysts' training records and ensure that analysts have adequate training and a thorough knowledge of this QAPP and related SOPs.

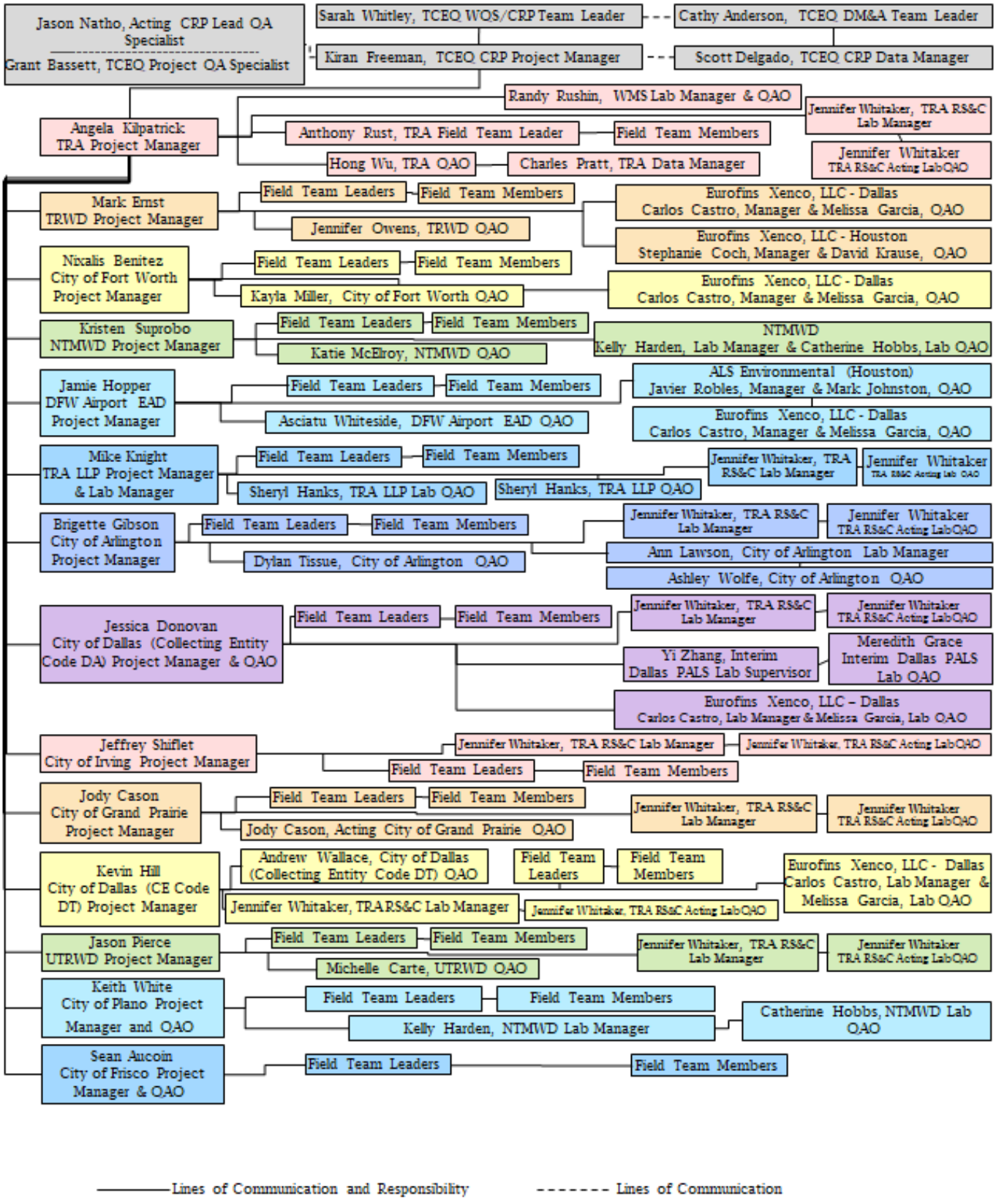
Laboratory Quality Assurance Officers

Jennifer Whitaker, Acting, TRA RS&C Laboratory
Sheryl Hanks, TRA LLP Laboratory
Ashley Wolfe, City of Arlington Laboratory
Melissa Garcia, Eurofins Xenco, LLC – Dallas
David Krause, Eurofins Xenco, LLC – Houston
Catherine Hobbs, North Texas Municipal Water District
Randy Rushin, Water Monitoring Solutions, Inc.
Mark Johnston, ALS Laboratory Group – Environmental Services Division
Meredith Grace – Interim Dallas Water Utilities PALS Analytical Laboratory

The laboratory quality assurance officers, in cooperation with the laboratory managers, are responsible for ensuring the data produced by each lab meets the quality control and quality assurance requirements as specified in this QAPP. Ensures compliance with this QAPP, lab quality manuals, and related SOPs through data review and internal audits as needed. If compliance issues are found, the laboratory QAO is responsible for notifying the laboratory manager. Data should be verified and approved prior to submittal to the WBPA QAO or TRA DM.

Project Organization Chart

Figure A4.1. Organization Chart - Lines of Communication



A5 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 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 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 Trinity River Authority (TRA) 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, January 2023 or most recent version (QMP).

The purpose of this QAPP is to clearly delineate TRA 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 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) and 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 *Clean Rivers Program Guidance and Reference Guide FY 2024-2025*.

The Trinity River Authority recognizes that there exists, within the Trinity River basin, a great number of agencies performing routine water quality sampling for their own objectives outside of the Clean Rivers Program. Basin maps can be found in Appendix C. These agencies generate a wealth of data concerning Trinity River basin water quality. It is therefore an objective of TRA to obtain data from existing programs as part of the basin-wide CRP water quality sampling program. This avoids duplication of effort and fosters communication and sharing of data between basin water resource agencies. Towards this end, the TRA CRP will coordinate closely with local agencies conducting water quality sampling programs. Although the sampling conducted by the WBPAs is quite comprehensive, the main stem of the Trinity River from Fort Worth to Oakwood was left relatively unmonitored. TRA began monitoring this stretch of the river in-house in order to more completely monitor the basin. The participation of the WBPAs is strictly voluntary, and it is recognized by both the TRA and the TCEQ that the monitoring conducted by WBPAs exist for purposes independent of the Clean Rivers Program. However, the water quality monitoring conducted by the WBPAs is done on a routine basis and is not biased to any season or flow condition which also fulfills the requirements of CRP monitoring. At the same time, it is recognized that the CRP must generate data of a known quality to be used by the TCEQ in a regulatory or decision-making capacity. This QAPP details the quality assurance process that will be followed to ensure quality data is being generated for and by this program. All procedures outlined in this QAPP, unless specified otherwise, are the same for all WBPAs and subcontractors. It is not the desire of the TRA CRP to dictate policy, only establish minimum criteria for acceptability of data under the Clean Rivers Program. Should WBPAs, the TRA Project Manager, or the TCEQ CRP Project Manager determine that the minimum criteria established by this QAPP are not being met, data affected by this deviation will not be submitted to the TCEQ. As participation in the TRA CRP by WBPAs is voluntary, WBPAs that sign this QAPP acknowledge that they will follow procedures herein set forth. Failure to follow these procedures will result in data not being submitted to the TCEQ. WBPAs are free to leave the TRA CRP at any time if they feel they can no longer comply with the requirements set forth in this QAPP. This QAPP will initially address the routine water quality monitoring practices of the Tarrant Regional Water District, the Lake Livingston Project, the City of Arlington, the City of Dallas (collecting entity code DA), the City of Dallas (collecting entity code DT), the City of Fort Worth, the City of Grand Prairie, the City of Irving, DFW Airport Environmental Affairs Department, North Texas Municipal Water District, Upper Trinity Regional Water District, the City of Plano, the City of Frisco and TRA's In-House Monitoring; other WBPAs may be added at a later date in the form of amendments to this QAPP.

It shall be the responsibility of the Project Manager of WBPAs or subcontractors employed by the TRA to ensure that project participants and the laboratories used maintain adequate quality controls as specified in this document. Towards the end of assuring that guidelines set forth in this QAPP are being met, the TRA CRP Project Manager shall conduct or oversee monitoring system audits (MSAs) on subcontractors and WBPAs. Such audits will be limited to activities generating data covered by this QAPP and will be designed to assess the components of WBPA QA processes that are not directly overseen by TRA, including but not limited to data review, verification, and

validation. Any non-compliance issues found during MSAs will be presented in writing to appropriate WBPA personnel. WBPAs are under no obligations to adopt suggested changes resulting from an audit. Failure to address compliance issues could however, invalidate some or all data being generated for the CRP and may result in flagging of data collected and submitted by WBPAs during the time period between MSAs. Such data, at the discretion of the TRA Project Manager and in consultation with TCEQ, may be withheld from submission to the TCEQ CRP Data Manager.

Routine water quality grab sampling has been an ongoing effort in the TRA Clean Rivers Program. 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, illicit discharges or stormwater runoff may not be captured by routinely scheduled monthly or quarterly grab sampling. Biological monitoring, on the other hand, may be able to provide a broader view of water quality in these systems. Biological monitoring consists of the collection of fish and benthic macroinvertebrates which are then identified and evaluated to determine either the level of aquatic life use in a stream or if the assigned aquatic life use level is being met. Biological populations respond predictably to water quality issues and alert monitoring entities to issues that may not be captured in a water quality grab sample. 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 tolerant species but it will also contain species that are intolerant of 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.

A6 Project/Task Description

Entities collecting routine water quality data include Tarrant Regional Water District, TRA's Lake Livingston Project, the City of Arlington, the City of Dallas (collecting entity code DA), the City of Dallas (collecting entity code DT), the City of Fort Worth, the City of Irving, the City of Grand Prairie, the City of Plano, the City of Frisco, DFW Airport EAD, NTMWD, UTRWD, and TRA. In all, this QAPP covers sampling activities at approximately 200 sites with a total of more than 100 routinely collected parameters. These parameters are sampled at various locations and frequencies (see Appendix B for a detailed list of routine monitoring stations and parameter groups to be monitored under this QAPP).

At least one site per fiscal year will be selected for biological monitoring in each biennium. The sites will be selected in order to be appropriate for biological monitoring and meet the qualifications stated in the "Representativeness" section of this QAPP (A7). See Sample Design Rationale and Site Selection Criteria in section B1 for details about site selection. As part of the biological monitoring program, Aquatic Life Monitoring procedures as described in 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)* will be followed and will result in data of sufficient quality to achieve the goals of this monitoring. All efforts will be made to collect one sample in the index period, between March 15 and July 1 of 2024 and 2025, as well as one sample in the critical period, between July 1 and September 30 of 2024 and between July 1 and August 31 of 2025. However, due to weather conditions samples scheduled for FY 2024 may fall in the beginning of FY 2025 and those scheduled for FY 2025 may fall in the beginning of FY 2026 because the critical and index periods do not line up with fiscal years. This project will include collection of fish and benthic macroinvertebrates for identification. In addition, physical habitat will be quantified. Instantaneous field measurements, flow measurements, and 24-hour diel monitoring will also be conducted. No water chemistry samples will be collected in conjunction with the biological sampling. TRA staff will conduct all field work. Fish identification will be performed in the field by TRA staff. Benthic macroinvertebrate identification will be conducted by Water Monitoring Solutions, Inc. Results will be summarized in a Biological Monitoring Reporting Packet (see Appendix H) and submitted to TCEQ in the format required by the DMRG. Results will also be submitted to the TCEQ SWQMIS database.

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 TRA Project Manager to the CRP Project Manager electronically. The TRA 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 TRA Project Manager, the TRA QAO, the CRP Project Manager, the CRP Lead QA Specialist, the TCEQ QA Manager or designee, the CRP Project QA Specialist, and 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 TRA Project Manager. Each affected party will sign the amendment signifying their awareness of and commitment to requirements contained in each amendment to the QAPP. The TRA 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 TRA and the TCEQ Project Manager and TCEQ technical staff. Appendices will be written in an abbreviated format and will reference the Basin QAPP where appropriate. Appendices will be approved by the TRA Project Manager, the TRA, the Laboratory (as applicable), and the CRP Project Manager, the CRP Project QA Specialist, the CRP Lead QA Specialist and additional parties affected by the Appendix, as appropriate. Copies of approved QAPP appendices will be distributed by the TRA to project participants before data collection activities commence. Each affected party will sign the appendix signifying their awareness of and commitment to requirements contained in each special project appendix to the QAPP. The TRA will maintain this documentation as part of the project's QA records and ensure that the documentation is available for review.

A7 Quality Objectives and Criteria

The purpose of routine water quality monitoring is to collect surface water quality data that can be used to characterize water quality conditions, identify significant long-term water quality trends, support water quality standards development, support the permitting process, and conduct water quality assessments in accordance with TCEQ's Guidance for Assessing and Reporting Surface Water Quality in Texas, July 2022 or most recent version (https://www.tceq.texas.gov/downloads/water-quality/assessment/integrated-report-2022/2022-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. Parameters beyond those needed for assessments may be collected by WBPAs and submitted to the TCEQ under this QAPP. These parameters are collected because WBPAs have monitoring objectives outside of the Clean Rivers Program, including watershed protection and stormwater permitting.

The parameters identified in the Tables of Appendix A are being collected on a routine basis with exceptions noted below. Parameters including conventionals, metals, bacteria, and some 24-hour DO monitoring which is collected throughout the year are being used to monitor trends or address the finding of the *TCEQ Integrated Report*. 24-hour DO monitoring is being conducted twice a year by TRWD (Table A7.1) and is considered biased to season. Aquatic Life Monitoring will be conducted by TRA (Table A7.5) and is considered biased to season.

The measurement performance specifications to support the project purpose for a minimum data set are specified in Appendix A and in the following text. Additional parameters associated with Aquatic Life Monitoring will be included in the final data set but are not listed in Table A7.5, specifically those for the reporting of taxa counts.

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 ("AWRL") 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.
- 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.
- When reporting data, no results may be reported below the LOQ stated in this QAPP.
  - TRWD has variable LOQs for nitrate+nitrite and orthophosphate based on site type. Stream sites have higher LOQs than reservoir sites.
  - There are variable AWRLs for Dissolved Cadmium, Dissolved Copper, and Dissolved Lead that are based on hardness. In cases where a lab's LOQ doesn't meet the lower AWRL for low hardness waters, these results will not be submitted to TCEQ and a note will be made in the Data Review Checklist that accompanies the data submittal. Currently this applies to the following parameters and WBPAs:
    - LLP – Dissolved Cadmium, Dissolved Copper, Dissolved Lead
    - City of Arlington – Dissolved Cadmium, Dissolved Lead
    - City of Dallas (collecting entity code DA) – Dissolved Cadmium, Dissolved Lead
    - TRA – Dissolved Cadmium, Dissolved Lead
    - City of Grand Prairie – Dissolved Cadmium, Dissolved Lead
    - City of Irving – Dissolved Cadmium, Dissolved Lead
- Measurement performance specifications for LOQ check samples are found in Appendix A.

Laboratory Measurement Quality Control Requirements and Acceptability Criteria are provided in Section B5.

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.

Biological monitoring sites will be selected that best represent conditions (both biological and water quality) of the entire water body. The chosen sites will have a good variety of microhabitats to sample, including a mixture of riffles, runs, and pools. Sampling will be avoided in reaches where water quality conditions and hydrology change dramatically over the reach, such as areas with a major tributary or contaminant source. Accessibility of sample locations will also be taken into consideration when choosing reaches – reaches that are too deep to wade and those where transportation of sampling equipment is excessively difficult (such as steep incised banks with impassable vegetation) will be avoided.

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 B10.

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.

A8 Special Training/Certification

New field personnel receive training in proper sampling and field analysis from either TRA staff or WBPA personnel that have had previous training. This training will include instruction on how to properly calibrate field equipment and perform field sampling. Field personnel training conducted by TRA staff is documented and retained in the TRA Project Manager's files and will be available during a monitoring systems audit.

Field staff training forms will be sent to all subcontractor and WBPA Project Managers at the beginning of each biennium. These forms will be filled out and returned to the TRA Project Manager and maintained by TRA. Field staff training records may also be maintained by the subcontractor or WBPA at their discretion.

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. These individuals have attended at least one Texas Fish Identification course offered by Texas State University, continuing education at conferences and workshops, or specialized Trinity River specific fish identification field classes taught by Bio-West.

The requirements for obtaining certified positional data using a Global Positioning System (GPS) are located in Section B10, Data Management.

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

A9 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 A9.1 Project Documents and Records

Document/Record	Location	Retention (yrs)	Format
QAPPs, amendments and appendices	TRA, WBPA, Subcontractor	7 years	Paper or Electronic
Field SOPs	TRA, WBPA, Subcontractor	7 years	Paper or Electronic
Laboratory Quality Manuals	Laboratories	7 years	Paper or Electronic
Laboratory SOPs	Laboratories	7 years	Paper or Electronic
QAPP distribution documentation	TRA	7 years	Paper or Electronic
Field staff training records	TRA (WBPA or Subcontractor – at their discretion)	7 years	Paper or Electronic
Field equipment calibration/maintenance logs	TRA, WBPA, Subcontractor	7 years	Paper or Electronic
Field instrument printouts	TRA, WBPA, Subcontractor	7 years	Paper or Electronic
Field notebooks, data sheets, or electronic field data collection tables	TRA, WBPA, Subcontractor	7 years	Paper or Electronic
Chain of custody records (See Appendix H for Tracking Logs for Benthics and Fish for TRA ALM Sampling)	TRA, WBPA, Subcontractor	7 years	Paper or Electronic
Laboratory calibration records	Laboratories	7 years	Paper or Electronic
Laboratory instrument printouts	Laboratories	7 years	Paper or Electronic
Laboratory data reports/results	Laboratories, WBPA, TRA	7 years	Paper or Electronic
Laboratory equipment maintenance logs	Laboratories	7 years	Paper or Electronic
Corrective Action Documentation	TRA, WBPA, Subcontractor, Laboratories	7 years	Paper or Electronic

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 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. At a minimum, test reports should include the following (for labs that serve outside customers):

- Sample results
- Units of measurement
- Sample matrix (if other than water or not identified in sample name)
- Dry weight or wet weight (as applicable)
- Station information
- Date and time of collection
- Holding time for *E. coli* (generally calculated as the difference between the sample collection date/time and the sample processing or analysis date/time)
- 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)
    - This may be listed under other field names based on the nomenclature for the standard reports generated by each lab (ALS Environmental Laboratory lists under the MQL field, Eurofins Xenco lists under the RL field, the City of Arlington Water Utilities Laboratory lists under the MRL field, and the NTMWD laboratory lists under the AQL field)
- Certification of NELAP compliance
- A statement of compliance/non-compliance with requirements and/or specifications
- Title of report and unique identifiers on each page
- Name/address of the laboratory
- Name/address of the client (if report is sent to an outside customer)
- A clear indication of the sample(s) analyzed
- Date and time of sample receipt
- Identification of method used
- Identification of samples that did not meet QA requirements and why (e.g. holding times exceeded)

- Clearly identified subcontract laboratory results (as applicable)
- Name/title of person accepting responsibility for the report
- Project-specific quality control results to include field split results (as applicable); equipment, trip, and field blank results (as applicable); and precision, bias, and LOQ check standard results
- 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

The TRA Lake Livingston Project does not produce laboratory test reports as described above for CRP samples. LLP field staff run the laboratory analyses and LLP analytical results are entered into electronic logs or hardcopy logs depending on the parameter being analyzed. Samples are identified by parameter, station, sample date, and a unique lab sample ID which are tied to combination field data sheets and chain of custody forms. All batch quality control results are associated with the ambient water samples by the batch analytical run date. All analyses and QC for each parameter satisfy current TNI Standard requirements (or CRP requirements, whichever is more stringent). Analytical results and any associated QC failure narratives are entered directly into the data submittal form (that is sent to the TRA DM) by field/laboratory staff. The CRP data set is delivered quarterly from LLP to the TRA DM via electronic database.

Electronic Data

Data will be submitted electronically to the TCEQ in the Event/Result file format described in the most current version of the DMRG, which can be found at https://www.tceq.texas.gov/waterquality/data-management/dmrg_index.html . A completed Data Review Checklist and Data Summary (see Appendix F) will be included with each data submittal. Portions of the Biological Monitoring Reporting Packet (Appendix H) will be submitted by TRA to TCEQ in the required BLOB format as described in the Surface Water Quality Monitoring Data Management Reference Guide.

Data from WBPAs will be received in Excel that will then be converted by the TRA to the Event/Result file format specified in the TCEQ's SWQM DMRG. Data from NTMWD is received in the Event/Result file format and is then reviewed by the TRA QA officer prior to submittal to TCEQ. City of Fort Worth will be collecting field data in Survey123. This data will be transmitted electronically to TRA and converted into the Event/Result file format specified in the TCEQ's SWQM DMRG.

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 for Water, Sediment, and Tissue, 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*" with exceptions for vertical profiles in rivers and streams and for at-depth water chemistry samples for TRWD. Vertical profiles will not be collected in rivers and streams by TRA or WBPAs under this QAPP. In addition to surface samples, TRWD collects middle and bottom depth water chemistry samples in reservoirs all year at sites near water supply intakes. TRWD also collects surface, middle, and bottom depth water chemistry samples at all other sites throughout the reservoirs from April to November. The number of middle and bottom depth water chemistry samples and their locations within the water column will be determined by TRWD field staff and depend on the depth of the site at the time of sampling. 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 TRA's and WBPA's procedures, QAPP, SOPs, etc., within 60 days of any final published update. Additional aspects outlined in Section B below reflect specific requirements for sampling under CRP and/or provide additional clarification.

Table B2.1 Sample Storage, Preservation and Handling Requirements

PARAMETER	MATRIX	CONTAINER	MINIMUM SAMPLE VOLUME (mL)	MAXIMUM STORAGE	PRESERVATION*
E. COLI	Water	Sterile Plastic	100	8 hrs**	Place on ice to cool to < 6 °C but not frozen (bottles provided by TRA are pre-dosed with sodium thiosulfate by the manufacturer)
SILICA, DISSOLVED	Water	Plastic	500	6 months	Place on ice to cool to < 6 °C but not frozen
SILICA, TOTAL	Water	Plastic	500	6 months	Place on ice to cool to < 6 °C but not frozen
CHLORIDE	Water	Plastic or Glass	50	28 d	Place on ice to cool to < 6 °C but not frozen
SULFATE	Water	Plastic or Glass	250	28 d	Place on ice to cool to < 6 °C but not frozen
BROMIDE	Water	Plastic or Glass	100	28 d	Place on ice to cool to < 6 °C but not frozen
FLUORIDE, TOTAL	Water	Plastic	500	28 d	Place on ice to cool to < 6 °C but not frozen
CHLOROPHYLL-A	Water	Amber or opaque Plastic or Glass	1000	Filter < 48 hrs and as soon as possible after sample collection; Frozen filters may be stored up to 28 d	Dark, place on ice to cool to < 6 °C but not frozen
PHEOPHYTIN-A	Water	Amber or opaque Plastic or Glass	1000	Filter < 48 hrs and as soon as possible after sample collection; Frozen filters may be stored up to 28 d	Dark, place on ice to cool to < 6 °C but not frozen
ALKALINITY, TOTAL	Water	Plastic or Glass	200	14 d	Place on ice to cool to < 6 °C but not frozen
RESIDUE, TOTAL NONFILTRABLE	Water	Plastic or Glass	1000 (Turbidity Dependent)	7 d	Place on ice to cool to < 6 °C but not frozen
RESIDUE, VOLATILE NONFILTRABLE	Water	Plastic or Glass	1000 (Turbidity Dependent)	7 d	Place on ice to cool to < 6 °C but not frozen
RESIDUE, TOTAL FILTRABLE	Water	Plastic or Glass	500	7 d	Place on ice to cool to < 6 °C but not frozen
NITRATE NITROGEN, TOTAL	Water	Plastic or Glass	100	48 h	Place on ice to cool to < 6 °C but not frozen
NITRITE NITROGEN, TOTAL	Water	Plastic or Glass	100	48 h	Place on ice to cool to < 6 °C but not frozen
ORTHOPHOSPHATE PHOSPHORUS, DISSOLVED, FILTER >15 MIN	Water	Plastic	100	48 h	Place on ice to cool to < 6 °C but not frozen
TURBIDITY, LAB	Water	Plastic or Glass	250	48 h	Place on ice to cool to < 6 °C but not frozen
ORTHOPHOSPHATE PHOSPHORUS, DISSOLVED, FILTER <15 MIN	Water	Plastic	100	48 h	Filter immediately with 0.45 µm filter, place on ice to cool to < 6C but not frozen
BIOCHEMICAL OXYGEN DEMAND	Water	Amber or opaque Plastic or Glass	1000	48 h	Place on ice to cool to < 6 °C but not frozen, dark
NITRITE PLUS NITRATE, TOTAL (Measured)	Water	Plastic or Glass	100	28 d	Add H_2SO_4 to pH < 2, place on ice to cool to < 6 °C but not frozen
NITROGEN, AMMONIA, TOTAL	Water	Plastic or Glass	100	28 d	Add H_2SO_4 to pH < 2, place on ice to cool to < 6 °C but not frozen
NITROGEN, KJELDAHL, TOTAL	Water	Plastic or Glass	500	28 d	Add H_2SO_4 to pH < 2, place on ice to cool to < 6 °C but not frozen
PHOSPHORUS, TOTAL	Water	Plastic	100	28 d	Add H_2SO_4 to pH < 2, place on ice to cool to < 6 °C but not frozen
CARBON, TOTAL ORGANIC	Water	Glass, Borosilicate For NTMWD-Plastic	100	28 d	Add H_2SO_4 to pH < 2, place on ice to cool to < 6 °C but not frozen For NTMWD Lab - Add H_3PO_4 to pH< 2, place on ice to cool to < 6 °C but not frozen
CARBON, DISSOLVED ORGANIC	Water	Glass	100	28 d	Filter immediately with 0.45 µm filter, add H_2SO_4 to pH < 2, place on ice to cool to < 6 °C but not frozen
HARDNESS, TOTAL	Water	Plastic or Glass	500	6 months if acidified, otherwise 48 hr	Add HNO_3 or H_2SO_4 to pH < 2, place on ice to cool to < 6 °C but not frozen
DISSOLVED METALS	Water	New or 1:1 HNO_3 rinsed Plastic or Glass	250	6 months	Field - Filter immediately with 0.45 µm filter Lab - add ultra-pure HNO_3 to pH < 2

PARAMETER	MATRIX	CONTAINER	MINIMUM SAMPLE VOLUME (mL)	MAXIMUM STORAGE	PRESERVATION*
TOTAL METALS	Water	New or 1:1 HNO3 rinsed Plastic or Glass	250	6 months	Lab - add ultra-pure HNO3 to pH < 2
TOTAL PETROLEUM HYDROCARBON	Water	Glass, VOAC (clear)	40 mL (x2)	14 d	Add HCl to pH < 2, place on ice to cool to < 6 °C but not frozen
PHYTOPLANKTON DENSITY, TOTAL	Water	Plastic or Glass	500	3 months	Formalin-Lugol's Solution and place on ice to cool to <6 °C but not frozen
FISH VOUCHERS	Fish	Plastic	As needed to submerge samples without crowding	7 days in Formalin, indefinite for isopropyl alcohol or ethanol	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 MACROINVERTEBRATES	Benthics	Plastic	As needed to submerge samples without crowding (no more than 1/2 full)	7 days in Formalin, indefinite for isopropyl alcohol or ethanol	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.
** *E. coli* samples should always be processed as soon as possible and incubated no later than 8 hours from time of collection. When transport conditions necessitate sample incubation after 8 hours from time of collection, the holding time may be extended and samples must be processed as soon as possible and within 30 hours. Extended hold times only apply to NTMWD monitoring.

Sample Containers

WBPAs may obtain sample containers in two ways: they can purchase them from contract labs and/or they may receive them from TRA. TRA maintains certificates from sample container manufacturers for those sample containers that TRA has purchased from the TRA RS&C lab or an outside vendor. The sample containers that TRA has purchased are stored at TRA. Certificates from sample container manufacturers are also maintained by the TRA RS&C lab or the WBPA contract lab. Records of cleaning and confirmation of cleanliness for labs that provide reusable sample containers are maintained by that lab. Details for sample containers used by each WBPA are listed below.

- LLP purchases all their own sample containers new with the exception of amber chlorophyll bottles (glass) which are washed in the laboratory dishwasher and tested for detergent residue after. Sample containers used for bacteriological samples are purchased sterilized and have 1% sodium thiosulfate added. The sample containers for metals are new, certified plastic bottles. Plastic containers are used for conventional parameters.
- The City of Arlington receives all their sample containers from TRA who purchases them from the TRA RS&C laboratory with the exception of metals bottles. Sample containers used for bacteriological samples are purchased sterilized and have 1% sodium thiosulfate added. The sample containers for metals are new, certified plastic bottles and purchased from an outside vendor. Amber plastic bottles are used for chlorophyll-a samples. Cubitainers are used for conventional parameters.
- The City of Fort Worth receives sample containers from their lab. Sample containers used for bacteriological samples are purchased sterilized and have 1% sodium thiosulfate added.
- NTMWD uses new, certified-clean plastic containers for TOC and metals and new, sterilized 100 mL bottles with sodium thiosulfate for bacteria. All other parameters collected by NTMWD are in reusable plastic containers that have been cleaned to standards specified in NTMWD Labware Cleaning Procedures 36-084. Amber plastic bottles are used for chlorophyll-a samples.
- TRWD receives all sample containers from their contract lab. All containers are purchased certified Level 1 precleaned. Sample containers used for bacteriological samples are purchased sterilized and have 1% sodium thiosulfate added.
- The City of Dallas (collecting entity code DA) receives metals sample containers from TRA which are new, certified plastic bottles and purchased from an outside vendor. Amber plastic bottles are used for chlorophyll-a samples. Sample containers used for bacteriological samples are purchased sterilized and have 1% sodium thiosulfate added. New certified plastic bottles are purchased from an outside vendor for all other parameters.
- The City of Dallas (collecting entity code DT) receives bacteriological sample containers from their contract

lab which are purchased sterilized and have 1% sodium thiosulfate added.

- DFW International Airport EAD receives all of their sample containers prepreserved from their contract lab. Sample containers used for bacteriological samples are purchased sterilized and have 1% sodium thiosulfate added. Total petroleum hydrocarbon sample containers are glass vials. The sample containers for metals are new, certified plastic bottles. Sample containers for conventional parameters are plastic.
- The City of Grand Prairie uses plastic containers for conventional parameters. Sample containers used for bacteriological samples are purchased sterilized and have 1% sodium thiosulfate added. Conventional and bacteriological sample containers are ordered from the TRA RS&C lab. The sample containers for metals are new, certified plastic bottles. Containers for dissolved metals are provided by TRA (which are new, certified plastic bottles and purchased from an outside vendor) while those for total metals are ordered from the TRA RS&C lab.
- The City of Irving uses cubitainers for conventional parameters which are provided by the TRA RS&C lab. Sample containers used for bacteriological samples are purchased sterilized and have 1% sodium thiosulfate added. Amber plastic bottles are used for chlorophyll-a samples. Containers for Chlorophyll-a and *E. coli* are provided by TRA who purchase them from the TRA RS&C laboratory. The sample containers for metals are new, certified plastic bottles and purchased by TRA from an outside vendor.
- The City of Plano uses pre-sterilized containers for bacteriological samples with 1% sodium thiosulfate added. They obtain these containers from the NTMWD lab.
- Upper Trinity Regional Water District uses cubitainers for conventional parameters and sulfuric acid ampules which are provided by TRA and sourced from the TRA RS&C lab. Sample containers used for bacteriological samples are purchased sterilized and have 1% sodium thiosulfate added. Amber plastic bottles are used for chlorophyll-a samples. Containers for Chlorophyll-a and *E. coli* are also provided by TRA who purchases them from the TRA RS&C laboratory.
- TRA uses cubitainers for conventional parameters. Glass bottles are used for total organic carbon. Sample containers used for bacteriological samples are purchased sterilized and have 1% sodium thiosulfate added. Amber plastic bottles (or rarely foil wrapped cubitainers) are used for chlorophyll-a and pheophytin-a samples. All sample containers are purchased from the TRA RS&C lab with the exception of metals containers. The sample containers for metals are new, certified plastic bottles and purchased by TRA from an outside vendor.
- Sample containers for biological monitoring by TRA are Nalgene® brand (or similar), 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; triple rinsing equipment such as buckets used for sample collection with ambient water or deionized water when the use of ambient water for rinsing is not feasible; and clean sampling techniques for metals. Field QC samples (identified in Section B5) are collected to verify that contamination has not occurred.

Documentation of Field Sampling Activities

Field sampling activities are documented on field data sheets or electronic 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 at Water Column Depth
    - Sampling depths for City of Dallas (collecting entity code DT) are defaulted to 0.3 m. It is not possible to measure depths at these sites. Water column depth is listed as "N/A – Trinity River".
    - Water column depth for City of Irving will continue to be recorded in the Comment field of the field data sheet until the current stock of field data sheets are used. When new field data sheets are ordered, this field will be added.
    - Water column depths for the City of Arlington are recorded in the observations section of the field data sheet.

    - For TRWD, all tributary sites are taken from bridges. Site depths are unknown and sample collection depth is defaulted to 0.3 meters.
    - For Grand Prairie, water column depth and sample collection depths will be recorded in the observations section of the field data sheet until the current stock of field data sheets are used. When new field data sheets are ordered, these fields will be added. Most sites are greater than 0.5m with generally only one site having variable 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 (e.g., exceptionally poor water
    - quality conditions/standards not met; stream uses such as swimming, boating, fishing, irrigation
    - pumps, etc.)
    - Watershed or instream activities (events impacting water quality, e.g., bridge construction,
    - livestock watering upstream, etc.)
    - Specific sample information
    - Missing parameters (i.e., when a scheduled parameter or group of parameters is not collected)
        - City of Dallas (collecting entity code DT) comments are recorded in field sampling logs and in photos.

Examples of Field Data Sheets to be used in biological monitoring are shown in Appendix H. The Discharge Measurement Summary Report is from a SonTek FlowTracker. The Stream Flow (Discharge) Measurement Form is for flow measurements conducted with a Hach or equivalent flow meter. The instrument used for flow measurement will be determined in the field based on flow conditions and the appropriate flow measurement report or form will be included in the data packet. Additional forms for biological monitoring data reporting as described in Appendix C of the *TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416)*, are also located in Appendix H. Nekton samples will be identified and separated by collection type – seining and/or electroshocking – and will include associated metadata.

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.

Exceptions to this include electronic field data collection conducted by TRA. Data are entered into an electronic form as shown in Appendix D. The data are stored in the Esri Cloud and then downloaded to the TRA SQL server. Changes are tracked via a series of auto-archived tables that tag changed records with the log-on information of the editor and the date and time the edits were made. NTMWD used electronic data capture in the field and delivers data to TRA in the event/result file format described in the DMRG. City of Fort Worth will be collecting field data in Survey123. This data will be transmitted electronically to TRA and converted into the Event/Result file format specified in the TCEQ's SWQM DMRG.

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. Deviations will be communicated from the WBPA or TRA field or laboratory staff to the WBPA or TRA Project Managers. WBPA Project Managers will forward information about deviations to the TRA Project Manager. It is the responsibility of the TRA Project Manager, in consultation with the TRA QAO, to ensure that the actions and resolutions to the problems are documented and that records are maintained in accordance with this QAPP. In addition, these actions and resolutions will be conveyed to the CRP Project Manager both verbally and in writing in the project progress reports and by completion of a CAP.

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

B3 Sample Handling and Custody

Sample Tracking

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

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

- Date and time of collection
- Site identification
- Sample matrix
    - City of Plano COCs do not specify sample matrix. All samples are surface waters.
- Number of containers
- Preservative used
    - City of Fort Worth COCs do not list preservatives. No analyses require acid preservation. All samples are place on ice.
- Was the sample filtered
    - COCs for DFW Airport EAD, City of Dallas (collecting entity code DT), City of Fort Worth, and City of Plano, and NTMWD do not indicate sample filtration. No parameters collected by these entities require field filtration. Dissolved orthophosphate collected by NTMWD is filtered by the lab and submitted under parameter code 70507.
    - COC for the City of Dallas (collecting entity code DA) Dallas PALS lab COC does not indicate sample filtration. All parameters analyzed by this lab are unfiltered. Dissolved orthophosphate is filtered by the lab and submitted under parameter code 70507.
    - COCs for the City of Grand Prairie, City of Irving, and TRWD do not indicate sample filtration in a separate field. Field filtration is identified by the word "Dissolved" for metals samples.
- 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 as negotiated with each WBPA. Label information may include:

- Site identification
    - This may be tied to site identification information on a field data sheet or chain of custody via a sample identification number.
- 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

Field data sheets will be used by all participants to document field conditions and sample collection. Electronic data loggers may also be used for this purpose, as appropriate. Examples of hardcopy or electronic field data sheets used by all WBPAs and subcontractors can be found in Appendix D. All samples are handled and transported under chain of custody forms from the sampling location to the laboratory. Chain of custody forms from all sampling entities can be found in Appendix E. In some cases, a combined field data sheet and chain of custody form is used. In these cases, the same form can be found in both Appendix D and Appendix E.

Samples are collected by field crews using appropriate sampling methodologies, preserved by acidification or other appropriate methods if necessary (preservation requirements are documented on field data sheets and/or chain of custody forms and labels), placed in coolers packed with ice and delivered to laboratories within holding times. This basic methodology is followed by all sampling personnel. Except for the instances listed below, all samples are delivered to laboratories the same day they are collected. Exceptions include:

1. TRWD Eastern Division (Cedar Creek Reservoir, Richland Chambers Reservoir) non-*E. coli* samples which are driven to the lab the day after collection (*E. coli* is collected during specific sampling events and delivered to the lab on the same day within the 6-hour field holding time);
2. City of Dallas (collecting entity code DA) metals which are delivered to the lab at the end of each sampling week until the completion of the sampling cycle. This is typically one calendar month except in cases where unsafe weather or other events prevent all sites from being sampled in a calendar month. In these cases, a sampling cycle may run into the following calendar month; and
3. On the occasions when shipment of samples is required (for example LLP personnel regularly ship TKN samples to the TRA RS&C lab for analysis), samples will be packed in ice and shipped in coolers using express delivery.

Upon arrival at the laboratory, transfer of custody is documented on chain of custody forms and samples are placed in laboratory coolers and logged into the laboratories' LIM Systems (LIMS). Laboratory personnel accepting samples will confirm that samples were placed on ice, and that there is still ice remaining around sample containers, indicating that an attempt was made to maintain the temperature of the samples at 6 °C. Samples which are required to be cooled but are not received on ice will either be flagged or not be analyzed. In addition, laboratory personnel will confirm that all samples were received as indicated on the COC forms and that they are preserved as needed (i.e. they will confirm that acidified samples have been lowered to pH < 2 and that lab staff acidify samples requiring acidification at the lab such as dissolved and total metals).

Sample Tracking Procedure Deficiencies and Corrective Action

All deficiencies associated with COC procedures, as described in this QAPP, are immediately reported to the TRA Project Manager. 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. Deficiencies will be communicated from the WBPA or TRA field or laboratory staff to the WBPA or TRA Project Managers. WBPA Project Managers will forward information about deficiencies to the TRA Project Manager. The TRA Project Manager in consultation with the TRA 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 Project Manager in the project progress report. CAPs will be prepared by the Lead Organization QAO and submitted to TCEQ CRP Project Manager along with project progress report.

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

B4 Analytical Methods

The analytical methods, associated matrices, and performing laboratories are listed in the Tables of Appendix A. The authority for analysis methodologies under CRP is derived from the 30 Tex. Admin. Code Ch. 307, in that data generally are generated for comparison to those standards and/or criteria. The *Texas Surface Water Quality*

Standards 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 Surface Water Quality Monitoring Procedures* as amended, 40 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 NELAP-accredited in accordance with 30 TAC Chapter 25. Copies of laboratory 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 Laboratory Manager/Supervisor, who will make the determination and notify the WBPA QAO if the problem compromises sample results. For samples that are analyzed at the TRA RS&C lab, the TRA QAO is also notified of issues with WBPA samples. The WBPA QAO will convey this information to the TRA QAO or Project Manager. 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 TRA Project Manager. The TRA QAO or Project Manager will include this information in the CAP and submit with the Progress Report which is sent to the TCEQ CRP Project Manager.

The definition of and process for handling deficiencies and corrective action are defined 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 corrective action plan (as described in section C1) may be necessary.

B5 Quality Control

Sampling Quality Control Requirements and Acceptability Criteria

The minimum field QC requirements, and program-specific laboratory QC requirements, are outlined in *SWQM Procedures*. Specific requirements are outlined below. Field QC sample results are submitted with the laboratory data report (see Section A9.).

Field blank

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

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

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

Field equipment blank

Field equipment blanks are required for metals-in-water samples when collected using sampling equipment. The field equipment blank is a sample of analyte-free media which has been used to rinse common sampling equipment to check the effectiveness of decontamination procedures. It is collected in the same type of container as the environmental sample, preserved in the same manner, and analyzed for the same parameter. Field equipment blanks for dissolved metals-in-water samples will be collected at a frequency of one per day of sampling. Only those samples collected on dates with associated field equipment blanks collected on the same day will be submitted to TCEQ.

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

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

Trip blank

Trip blanks are required for volatile organic analyses (VOA) only. VOA trip blanks are samples prepared in the laboratory with laboratory pure water and preserved as required. A trip blank is submitted with each ice chest of VOA samples submitted to the laboratory. They are transported to the sampling site, handled like an environmental sample, and returned to the laboratory for analysis. Trip blanks are not opened in the field. Their purpose is to check contamination of the sample through leaching of the septum. The analysis of trip blanks should yield values less than the LOQ. When target analyte concentrations are very high, blank values should be less than 5% of the lowest value of the batch, or corrective action will be implemented.

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 quality manuals (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 the Tables of 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 the Tables of 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 the Tables of 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). These duplicates will be processed from a 100 mL sample that has been split and diluted (1:1) or a volume that is sufficient volume should be collected to analyze laboratory duplicates from the same sample container. Some TRA WBPA's collect bacteria samples in a 100mL container that will be split at the laboratory and diluted. The samples and laboratory duplicates will be run on the diluted samples and the LOQ for these diluted samples will be increased by the dilution factor.

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 the Tables of Appendix A.

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

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

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

Laboratory equipment blank

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

Matrix spike

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

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

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

percent recovery (%R).

The percent recovery of the matrix spike is calculated using the following equation, where %R is percent recovery, S_{SR} is the concentration measured in the matrix spike, S_R is the concentration in the parent sample, and S_A is the concentration of analyte that was added:

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

Matrix spike recoveries are generally compared to the acceptance criteria published in the mandated test method. If the matrix spike results are outside established criteria, the data for the analyte that failed in the parent sample is not acceptable for use under this project and will not be reported to TCEQ. The result from the parent sample associated with that failed matrix spike will be considered to have excessive analytical variability and will be qualified by the laboratory as not meeting project QC requirements. Depending on the similarities in composition of the samples in the batch, the TRA may consider excluding all of the results in the batch related to the analyte that failed recovery.

Matrix spike recoveries may also be compared to the same acceptance criteria established for the associated LCS recoveries, rather than the matrix spike recoveries published in the mandated test method. The EPA 1993 methods (i.e. ammonia-nitrogen, ion chromatography, TKN) that establish matrix spike recovery acceptance criteria are based on recoveries from drinking water that has very low interferences and variability and do not represent the matrices sampled in the CRP. If the matrix spike results are outside laboratory-established criteria, there will be a review of all other associated quality control data in that batch. If all of quality control data in the associated batch passes, it will be the decision of the laboratory QAO or TRA QAO in consultation with the TRA Project Manager 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, TRA 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 TRA Project Manager, in consultation with the TRA 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 TRA Project Manager and QAO will be relied upon in evaluating results.

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

Laboratory measurement quality control failures are evaluated by the laboratory staff. The disposition of such failures and the nature and disposition of the failure is reported to the Laboratory QAO. The Laboratory QAO will discuss the failure with the WBPA Project Manager and the TRA Project Manager for samples that are analyzed at the TRA RS&C lab. The WBPA Project Manager will transmit this information to the TRA QAO or Project Manager. If applicable, the WBPA or TRA Project Manager will include this information in a CAP and submit with the Progress Report which is sent to the TCEQ CRP Project Manager.

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 that the sub-contracting laboratory utilize the same reporting limits as the signatory laboratory and performs all required quality control analysis outlined in this QAPP. The signatory laboratory is also responsible for quality assurance of the data prior to delivering it to the WBPA or TRA, 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 (WBPA or TRA) when requested.

B6 Instrument/Equipment 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. Equipment records are kept on all field equipment and a supply of critical spare parts is maintained by Field Team Lead as specified in section A4 and in figure D2.1.

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

B7 Instrument Calibration and Frequency

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

NTMWD calibration procedures are detailed in their *YSI EXO1 Multiparameter Sonde SOP #38-067 (Revision 0.0, Effective 5/27/2022)*. Due to the size of their region, the frequency of monitoring, and the number of sondes used, NTMWD has found it necessary and beneficial to maintain standards in a clean calibration reservoir that is sealed between calibrations for up to a week to control cost and waste. Because of the chemically stable nature of the specific conductance and pH standards used for field sonde calibrations, the secondary source checks for specific conductance and pH 7, the TCEQ defined QC limits, and the SOP requirement to replace the standard if any QC failures occur, the NTMWD procedures have been determined to meet or exceed the *SWQM Procedures*. *SOP #38-067* will be available upon request.

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

B8 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 appropriate WBPA, laboratory, or TRA Project Managers. 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 either new and purchased precleaned to EPA specifications, or are cleaned to appropriate specifications by the laboratory. Calibration gases are purchased having

known concentrations, and the documentation is maintained on file by the laboratory managers/supervisors. 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.

B9 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 Flow, Instantaneous 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 the National Weather Service Advanced Hydrologic Prediction Service and are published on the NOAA website at https://water.weather.gov/precip/. These data are displayed as an interactive map with a grid resolution of 4x4 km. Precipitation grids represent a 24-hour precipitation total ending at 1200 GMT (or 0700 Central). This website is used to determine the number of days between the sample event and the last precipitation event. It will be up to the professional judgement of the WBPA or TRA field staff to determine if precipitation events were sufficient to produce runoff that may influence water quality and correctly report the number of days between the most recent precipitation and the sampling event. These data will be submitted to the TCEQ under parameter code 72053 Days Since Precipitation Event.

Air temperature (parameter code 00020) may be obtained from a variety of sources. These may include in-vehicle air temperature displays; local weather stations associated with NOAA, TWDB, or airports; or reports from cellular phone weather applications.

B10 Data Management

Data Management Protocols are addressed in the TRA CRP Data Management Plan that is located in Appendix G of this document.

Data will be managed in accordance with the *TCEQ DMRG* (most recent revision), and applicable TRA 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, etc.	Continuous	TRA	Monitoring of the project status and records to ensure requirements are being fulfilled	Report to TCEQ in Quarterly Report
Monitoring Systems Audit of TRA	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	Dates to be determined by TRA (at least once per biennium)	TRA	Field sampling, handling and measurement; facility review; review of lab reports for entities submitting data from labs other than the TRA RS&C Lab; CRP data management and QA processes that are not directly overseen by TRA	30 days to respond in writing to the TRA. TRA 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*, or other applicable guidance. Deficiencies may invalidate resulting data and require corrective action. Repeated deficiencies should initiate a CAP. Corrective action for deficiencies may include for samples to be discarded and re-collected. Deficiencies are documented in logbooks, hardcopy or electronic field data sheets, etc. by field or laboratory staff, are communicated to the TRA Project Manager (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 TRA Project Manager, in consultation with the TRA QAO, to ensure that the actions and resolutions to the problems are documented and that records are maintained in accordance with this QAPP. In addition, these actions and resolutions will be conveyed to the CRP Project Manager both verbally and in writing in quarterly progress reports and by completion of a CAP.

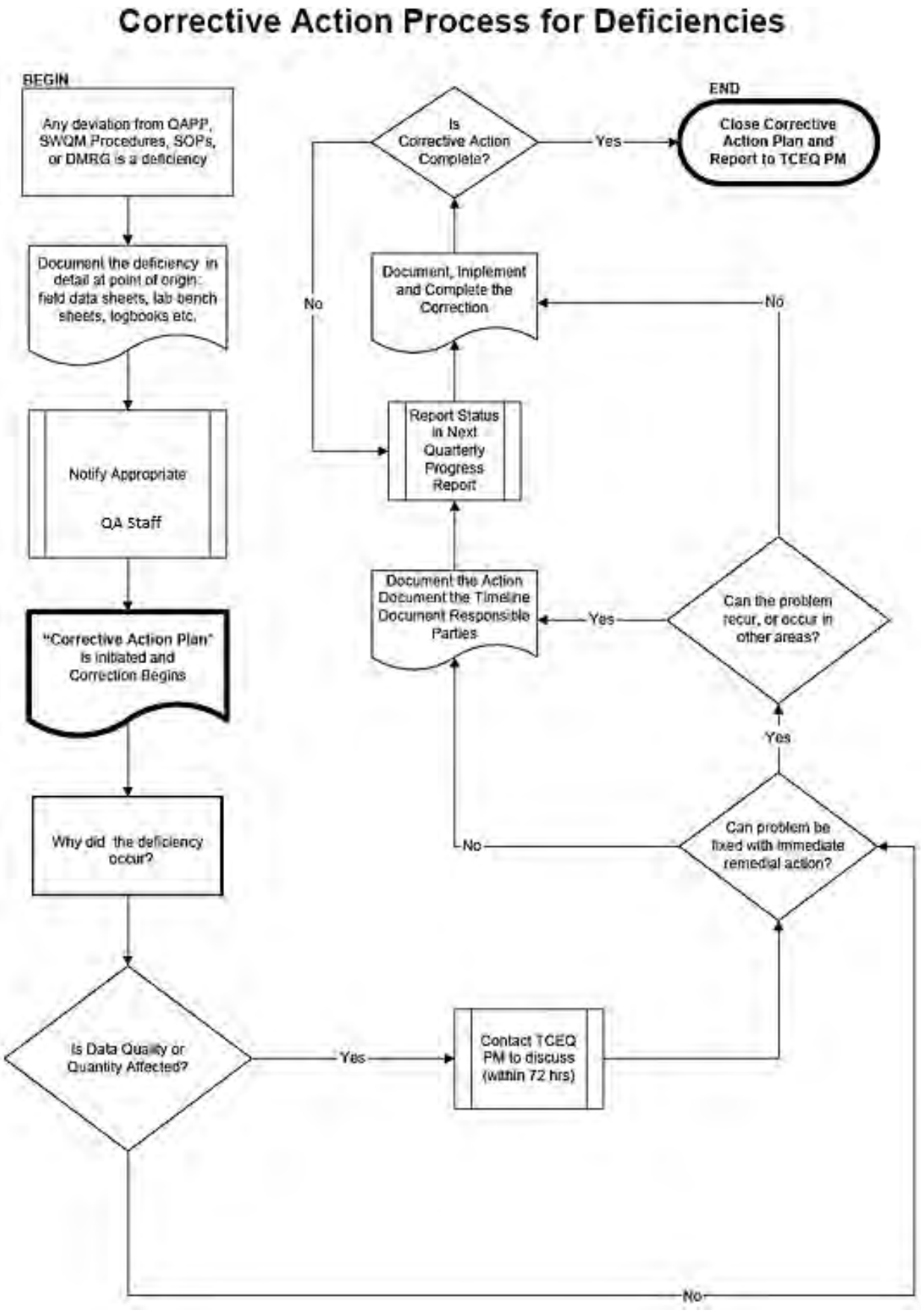
Corrective Action

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



The status of CAPs will be included with quarterly progress reports. In addition, significant conditions which, 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 TRA Project Manager is responsible for ensuring that corrective actions have been implemented and tracks deficiencies and corrective actions. Records of audit findings and corrective actions are maintained by the TRA Project Manager. 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.

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
Non-Conformance Report	As Needed	As Needed	Field Staff Laboratory Staff TRA QAO or TRA PM	TRA QAO and/or TRA PM TCEQ PM
CRP Progress Reports	Quarterly	December 15, 2023 March 15, 2024 June 15, 2024 September 15, 2024 December 15, 2024 March 15, 2025 June 15, 2025 August 15, 2025	TRA Project Manager	TCEQ CRP Project Management
Monitoring Systems Audit Report and Response	As Needed	As Needed	TRA Project Manager	TCEQ CRP Project Management
Data Summary	As Needed	As Needed	TRA QAO	TCEQ CRP Project Management
Data Transmittals	Quarterly	In the quarter following the quarter the samples were collected	WBPA QAO	TRA QAO

Reports to TRA Project Management

WBPAs routinely submit water quality data and data checklists to TRA CRP staff on a quarterly basis in Excel format. Data transmittals include both field and laboratory analyzed data and notes indicating the reason for any missing or invalidated data (e.g. instrument failure, dry or inaccessible sites, laboratory QC failures). TRA does not store field data sheets from WBPAs but they are available from the WBPA upon request. Several WBPAs use the TRA RS&C lab for some or all of their analyses. TRA RS&C provides lab data and lab QC information to TRA in both CSV format and in PDF for these samples. This includes TRA, UTRWD, the City of Grand Prairie, the City of Irving, metals collected by the City of Dallas (collecting entity code DA), conventionals and bacteria collected by the City of Arlington, and TKN collected by LLP. The TRA Data manager combines the lab data received from the TRA RS&C lab for these entities with the field data submitted by each entity. For biological monitoring, benthic macroinvertebrate identification data will be submitted to the TRA Data Manager by Water Monitoring Solutions, Inc. in a format appropriate for completing the Biological Monitoring Reporting Packet (Appendix H) in order to prepare 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. In addition, portions of the Biological Monitoring Reporting Packet (Appendix H) will be submitted by TRA in the formats required for event/result text and BLOB files.

Progress Report

Summarizes the TRA's activities for each task; reports monitoring status, problems, delays, deficiencies, status of open CAPs, and documentation for completed CAPs; documents quarterly check-ins with WBPAs and labs and internal TRA staff to ensure that various aspects of the QAPP are up to date; and outlines the status of each task's deliverables.

Monitoring Systems Audit Report and Response

Following any audit performed by the TRA, 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 TRA 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, laboratory, habitat, benthic, and nekton data will be reviewed and verified for integrity and continuity, reasonableness, and conformance to project requirements, and then validated against the project objectives and measurement performance specifications which are listed in Section A7 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.

D2 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 D2.1, respectively, and detailed in Figures D2.1 and D2.2. 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 the third column of Table D2.1 and detailed in Figure D2.3 is performed by the WBPA QAO and/or PM for data generated by each WBPA and for their data analyzed at labs other than the TRA RS&C lab. For data generated by TRA or WBPA data that is analyzed by the TRA RS&C lab, this review is conducted by the TRA PM, DM, or 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 Quality Assurance Specialist. 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 TRA 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 TRA QAO with the data in the Data Summary (See Appendix F). All failed QC checks, missing samples, missing analytes, missing parameters, and suspect results should be discussed in the Data Summary.

Table D2.1: Data Review Tasks

Data to be Verified	Field Task	Laboratory Task	DM/QAO/PM Task
Sample documentation complete; samples labeled, sites identified	X		
Field QC samples collected for all analytes as prescribed in the TCEQ SWQM Procedures Manual and this QAPP	X		
Standards and reagents traceable		X	
Chain of custody complete/acceptable	X	X	
NELAP Accreditation is current		X	X (WBPA QAO, TRA PM, TRA QAO)
Sample preservation and handling acceptable	X	X	
Holding times not exceeded	X	X	X (WBPA QAO, TRA QAO, TRA DM)
Bacteriological records complete	X	X	
Collection, preparation, and analysis consistent with SOPs and QAPP	X	X	X (WBPA PM, TRA PM, TRA QAO)
Field documentation (e.g., biological, stream habitat, flow) complete	X		X (WBPA QAO, TRA QAO, TRA DM)
Instrument calibration data complete	X	X	
QC samples analyzed at required frequency	X	X	X (WBPA PM, WBPA QAO, TRA PM, TRA QAO)
QC results meet performance and program specifications		X	X (TRA QAO, TRA DM)
Analytical sensitivity (LOQ/AWRL) consistent with QAPP		X	X (TRA QAO, TRA DM)
Results, calculations, transcriptions checked		X	
Laboratory bench-level review performed		X	
All laboratory samples analyzed for all scheduled parameters		X	X (WBPA QAO, TRA QAO, TRA DM)
Corollary data agree		X	X (WBPA QAO, TRA QAO, TRA DM)
Nonconforming activities documented	X	X	X (WBPA PM, WBPA QAO, TRA PM, TRA QAO)
Outliers confirmed and documented; reasonableness check performed			X (TRA QAO, TRA DM)
Dates formatted correctly	X		X (WBPA QAO, TRA QAO, TRA DM)
Depth reported correctly and in correct units	X		X (WBPA QAO, TRA QAO, TRA DM)
TAG IDs correct	X		X (TRA QAO, TRA DM)
TCEQ Station ID number assigned	X		X (TRA QAO, TRA DM)
Valid parameter codes	X		X (TRA QAO, TRA DM)
Codes for submitting entity(ies), collecting entity(ies), and monitoring type(s) used correctly			X (TRA QAO, TRA DM)
Time based on 24-hour clock	X		X (WBPA QAO, TRA QAO, TRA DM)
Check for transcription errors (hardcopy and/or electronic)	X		X (WBPA QAO, TRA QAO, TRA DM)
Sampling and analytical data gaps checked (e.g., all sites for which data are reported are on the coordinated monitoring schedule)	X		X (WBPA QAO, TRA QAO, TRA DM)
Field instrument pre- and post-calibration results within limits	X		X (WBPA QAO, TRA QAO, TRA DM)
10% of data manually reviewed	X		X (WBPA QAO, TRA QAO, TRA DM)

Figure D2.1: Data Review Task Details for Field Team Members/Leaders

Tasks to be completed/verified in the field and/or prior to sample delivery to lab by field team members and/or leaders or prior to submittal to TRA by field team leaders.

Sample documentation is complete with samples labeled and sites identified – **Field team members** should ensure that all required and necessary portions of field documentation and sample labels are properly completed. **Field team leaders** should ensure that field team members are properly trained.

- Dates formatted correctly.
- Time based on a 24-hour clock.
- Depth reported correctly and in correct units.
- Tag IDs correct (if entity assigns Tag IDs prior to submittal to TRA).
- TCEQ Station ID number assigned.
- Valid parameter codes.
- Chain of custody complete/acceptable (if it is a separated document from the field data sheet).
- Field documentation (e.g. biological, stream habitat, flow) complete (for entities that conduct this work).
- Bacteriological records complete.

10% of data manually reviewed – **Field team leaders and/or WPBA data entry personnel** should review data for key stroke errors prior to submittal.

- Absence of transcription errors confirmed.
- Absence of electronic errors confirmed.
- Sampling and analytical data gaps checked (e.g. all sites for which data are reported are on the coordinated monitoring schedule) – if gaps in data are known, field team leaders should notify TRA prior to data submittal.

Collection, preparation, and analysis of samples consistent with SOPs and QAPP – **Field team members and/or leaders** should ensure that samples have been collected in accordance with the QAPP and reference documents.

- Sample preservation and handling acceptable – Samples should be preserved and/or filtered in the field within 15 minutes and stored on ice until deliver to lab.
- Holding times not exceeded – Sample should be delivered to the lab on the data of collection (with the exception of metals in water and as negotiated) to ensure that the lab has adequate time to prepare and analyze samples.
- Field QC samples collected for analytes as prescribed in the TCEQ SWQM Procedures Manual – **Field team members and/or leaders** should ensure that field equipment blanks are collected on a 10% basis (or as negotiated) and are collected in the required manner.
- Instrument calibration data complete – **Field team leaders** should ensure that field instrument calibration logs are properly filled out and maintained and that calibration results are within limits. In addition, TRA should be notified of any post-calibration failures at the time of data submittal to TRA.

Nonconforming activities documented – Any issues that result in unusable or loss of data in the field should be noted and transmitted to the TRA QAO via **field team leader** and WBPA QAO/PM. Issues can include, but not be limited to, field instrument calibration failures, dry sites, lack of access to a site, broken sample bottles, and improper collection/preservation methods.

Figure D2.2: Data Review Task Details for Laboratory Receiving / Analyst / Manager / Supervisor / QAO

Tasks to be completed/verified in the lab and by lab receiving staff, analysts, QAOs, and/or supervisors/managers.

Chain of custody complete/acceptable – **Lab receiving staff** should ensure that COCs are acceptable before field team members leave the lab.
Sample preservation and handling acceptable – **Lab receiving staff** should check that samples are preserved as required and note in the lab information management system and/or lab reports if they are not.
Standards and reagents traceable – **Lab analysts/QAOs/supervisors/managers** should ensure that standards and reagents are traceable and properly logged.
NELAP Accreditation is current – **Lab QAOs and supervisors/managers** should maintain NELAP accreditation and should notify TRA of any changed to methods or other information as they occur.
Holding times not exceeded – **Lab analysts and QAOs** should ensure that samples are prepared and analyzed within holding times.
Collection, preparation, and analysis consistent with SOPs and QAPP – **Lab analysts and QAOs** should ensure that samples are prepared and analyzed as described in Table A7 of the QAPP. **Lab supervisors/ managers** should ensure that all lab analysts are properly trained for sample preparation and analysis.
Instrument calibration data complete – **Lab analysts** should ensure that lab instruments are properly calibrated and the calibration is logged prior to sample analysis. **Lab QAOs and supervisors/managers** should review calibration logs for completeness.
Bacteriological records complete – **Lab analysts** should ensure that bacteriological records are complete. **Lab QAOs and supervisors/managers** should review records for completeness.
QC samples analyzed at required frequency – **Lab analysts** should ensure that lab QC samples are analyzed at the required frequency. **Lab QAOs and supervisors/managers** should review records to ensure that QC samples have been analyzed at required frequency.
QC results meet performance and program specifications – **Lab analysts** should ensure that lab QC samples meet required performance specifications at the time of analysis. **Lab QAOs and supervisors/managers** should review records to ensure that QC samples met required performance specifications.
Analytical sensitivity (Limit of Quantitation/Ambient Water Reporting Limit) consistent with QAPP – **Lab analysts** should ensure that AWRL levels are achieved during instrument calibration and analysis. **Lab QAOs and supervisors/managers** should review records to ensure that AWRLs were met.
Results, calculations, transcriptions checked – **Lab analysts, QAOs, and supervisors/managers** should review results, calculations, and transcriptions for errors.
Laboratory bench-level review performed – **Lab analysts, QAOs, supervisors/managers**.
All laboratory samples analyzed for all scheduled parameters – **Lab analysts** should ensure that all requested analyses are performed. **Lab QAOs and supervisors/managers** should review records to ensure all requested analyses were performed.
Corollary data agree – **Lab analysts, QAOs, supervisors/managers** should review data to ensure that all analyses are properly matched to their associated samples, QC information, and flags.
Nonconforming activities documented – **Lab QAOs and supervisors/managers** should document any events of nonconformance with SOPs (including the QAPP). In a nonconformance affects the quality of the data, **lab supervisors/managers** should contact TRA.

Figure D2.3: Data Review Task Details for WBPA QAO/PM, TRA DM/QAO/PM

Tasks to be completed/verified by the WBPA QAO/PM, TRA DM/QAO/PM upon receipt of data and/or prior to submittal to TCEQ.

WBPA PM, TRA PM, TRA QAO – Collection, preparation, and analysis consistent with SOPs and QAPP – Ensure that all monitoring conducted under this QAPP is conducted as required.
WBPA QAO, TRA PM, TRA QAO – NELAP Accreditation is current – Check methods reported from lab against NELAP Fields of Accreditation. Fields of Accreditation for labs can be found at https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf.
WBPA QAO, TRA QAO, TRA DM – Holding times not exceeded – Check difference between sample date and analysis date and compare to Table B2.1 to ensure that no samples exceeded hold time.
TRA QAO, TRA DM – QC results meet performance and program specifications – Check lab QC data against tables in Section A7.
TRA QAO, TRA DM – Analytical sensitivity (Limit of Quantitation/Ambient Water Reporting Limits) consistent with QAPP – Check AWRLs and LOQs against tables in Section A7.
TRA QAO, TRA DM – Outliers confirmed and documented, reasonableness check performed – Check data against associated min/max values, total versus dissolved parameters, etc.
WBPA QAO, TRA QAO, TRA DM – Dates formatted correctly – Format to mm/dd/yyyy.
WBPA QAO, TRA QAO, TRA DM – Time based on 24-hour clock – Format to hh:mm.
WBPA QAO, TRA QAO, TRA DM – Depth reported correctly and in correct units – Ensure depth is reported in meters.
TRA QAO, TRA DM – Valid parameter codes – Check against tables in Section A7.
TRA QAO, TRA DM – TCEQ Station ID numbers assigned – Check against Table B1.1.
TRA QAO, TRA DM – TAG IDs correct – Ensure that all tag numbers start with "TR" and are followed by "#####', "####A", or "###AA" (where "A" is a letter A through Z).
TRA QAO, TRA DM – Codes for submitting entity(ies), collecting entity(ies), and monitoring type(s) used correctly – Ensure that all program codes are complete and correct.
WBPA QAO, TRA QAO, TRA DM – Corollary data agree – Ensure that all associated field and lab data are properly matched.
WBPA QAO, TRA QAO, TRA DM –10% of data manually reviewed – For data sets that are entered manually.
WBPA QAO, TRA QAO, TRA DM – Sampling and analytical data gaps checked (e.g. all sites for which data are reported are on the coordinated monitoring schedule) – Check against Table B1.1. If no data are reported for a site due to a dry site, flooding, unsafe conditions, etc., ensure that an event with comments indicating these conditions and any associated results that can be collected (flow severity, air temperature, drought parameters, etc.) are submitted.
WBPA QAO, TRA QAO, TRA DM – All laboratory samples analyzed for all scheduled parameters – Ensure that all expected results are received are accounted for.
WBPA PM, WBPA QAO, TRA PM, TRA QAO – QC samples analyzed at required frequency – Ensure that all field QC samples are conducted on a 10% basis or as negotiated.
WBPA QAO, TRA QAO, TRA DM – Absence of transcription errors confirmed – Ensure that any suspected key stroke errors have been confirmed or corrected.
WBPA QAO, TRA QAO, TRA DM – Absence of electronic errors confirmed – Ensure that no errors made during conversion of data to electronic event/result format. Ensure that no errors are made during conversion of data to final text format.
WBPA QAO, TRA QAO, TRA DM – Field documentation (e.g. biological, stream habitat, flow) complete.
WBPA QAO – Field instrument pre- and post-calibration results within limits – Ensure that any data that failed a post-calibration is noted in data submittals and that the TRA QAO is notified.
WBPA PM, WBPA QAO, TRA PM, TRA QAO – Nonconforming activities documented – Ensure that any nonconformance that affects the quality of data is documented and notify TCEQ of nonconformance.

D3 Reconciliation with User Requirements

Data produced in this project, and data collected by other organizations (e.g., USGS, TCEQ, etc.), will be analyzed and reconciled with project data quality requirements. Data which do not meet requirements will not be submitted to SWQMIS nor will be considered appropriate for any of the uses noted in Section A5.

Appendix A: Measurement Performance Specifications (Table A7.1-A7.14)

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 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 A7 are stored in SWQMIS. Any parameters listed in Tables A7 that do not have a valid TCEQ parameter code assigned will not be stored in SWQMIS.

TABLE A7.1 Measurement Performance Specifications for Tarrant Regional Water District

Field Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)*	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
RESERVOIR ACCESS NOT POSSIBLE LEVEL TOO LOW ENTER 1 IF REPORTING	NS	other	TCEQ Drought Guidance	00051	NA*	NA	NA	NA	NA	Field
RESERVOIR STAGE (FEET ABOVE MEAN SEA LEVEL)***	FT ABOVE MSL	water	TWDB	00052	NA*	NA	NA	NA	NA	Field
RESERVOIR PERCENT FULL***	% RESERVOIR CAPACITY	water	TWDB	00053	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)*	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)*	µs/cm	water	EPA 120.1 and TCEQ SOP V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)*	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)*	s.u.	water	EPA 150.1	00400	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	NA*	NA	NA	NA	NA	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	NA*	NA	NA	NA	NA	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	NA*	NA	NA	NA	NA	Field
Flow Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA	NA	NA	NA	NA	Field
STAGE, STREAM (FEET)	FT	water	TCEQ SOP V1	00065	NA	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	NA	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)******	cfs	water	TCEQ SOP V1	74069	NA	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	NA	NA	NA	NA	NA	Field
24 Hour Parameters in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE), 24HR AVG	DEG C	Water	TCEQ SOP V1	00209	NA	NA	NA	NA	NA	Field

24 Hour Parameters in Water (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
WATER TEMPERATURE, DEGREES CENTIGRADE, 24HR MAX	DEG C	Water	TCEQ SOP V1	00210	NA	NA	NA	NA	NA	Field
TEMPERATURE, WATER (DEGREES CENTIGRADE) 24HR MIN	DEG C	Water	TCEQ SOP V1	00211	NA	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR AVG	µS/cm	Water	TCEQ SOP V1	00212	NA	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MAX	µS/cm	Water	TCEQ SOP V1	00213	NA	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MIN	µS/cm	Water	TCEQ SOP V1	00214	NA	NA	NA	NA	NA	Field
PH, S.U., 24HR MAXIMUM VALUE	std. units	Water	TCEQ SOP V1	00215	NA	NA	NA	NA	NA	Field
PH, S.U., 24HR, MINIMUM VALUE	std. units	Water	TCEQ SOP V1	00216	NA	NA	NA	NA	NA	Field
WATER TEMPERATURE, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00221	NA	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00222	NA	NA	NA	NA	NA	Field
pH, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00223	NA	NA	NA	NA	NA	Field
DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89855	NA	NA	NA	NA	NA	Field
DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89856	NA	NA	NA	NA	NA	Field
DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89857	NA	NA	NA	NA	NA	Field
DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	89858	NA	NA	NA	NA	NA	Field
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, IDEXXMETHOD, MPN/100ML	MPN/100 mL	water	SM 9223 B	31699	1	1	NA	0.50 ****	NA	Eurofins Xenco-Dallas
Conventional Parameters in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
ALKALINITY, TOTAL (MG/L AS CACO3)	mg/L	water	SM 2320 B	00410	20	4	NA	20	NA	Eurofins Xenco-Houston
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540 D	00530	5	5	NA	NA	NA	Eurofins Xenco-Houston
RESIDUE, VOLATILE NONFILTRABLE (MG/L)	mg/L	water	EPA 160.4	00535	5	2.8	NA	NA	NA	Eurofins Xenco-Houston
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.1 Rev. 2.0 (1993)	00610	0.1	0.1	70-130	20	80-120	Eurofins Xenco-Houston
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2	00625	0.2	0.2	70-130	20	80-120	Eurofins Xenco-Houston

Conventional Parameters in Water (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
NITRITE PLUS NITRATE, TOTAL ONE LAB DETERMINED VALUE (MG/L AS N)	mg/L	water	EPA 353.2	00630	0.05	0.02 (lake) 0.05 (tribs) *****	70-130	20	80-120	Eurofins Xenco-Houston
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.1	00665	0.06	0.02	70-130	20	80-120	Eurofins Xenco-Houston
CARBON, TOTAL ORGANIC, NPOC (TOC), MG/L	mg/L	water	SM 5310 C	00680	2	1	NA	NA	NA	Eurofins Xenco-Houston
CARBON, DISSOLVED ORGANIC, DNPC (DOC), MG/L	mg/L	water	SM 5310 C	00681	NA	1	70-130	20	80-120	Eurofins Xenco-Houston
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.0 (1993)	00940	5	0.5	70-130	20	80-120	Eurofins Xenco-Houston
SULFATE (MG/L AS SO4)	mg/L	water	EPA 300.0 Rev. 2.0 (1993)	00945	5	0.5	70-130	20	80-120	Eurofins Xenco-Houston
SILICA, DISSOLVED (MG/L AS SIO2)	mg/L	water	EPA 200.7 Rev 4.4 (1994)	00955	NA	1	70-130	20	80-120	Eurofins Xenco-Houston
SILICA, TOTAL (MG/L AS SI02)	mg/L	water	EPA 200.7 Rev 4.4 (1994)	00956	NA	1	70-130	20	80-120	Eurofins Xenco-Houston
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	µg/L	water	SM 10200 H	32211	3	0.0333	NA	20	80-120	Eurofins Xenco-Dallas
RESIDUE, TOTAL FILTRABLE (DRIED AT 180C) (MG/L)	mg/L	water	SM 2540 C	70300	10	2.5	NA	20	80-120	Eurofins Xenco-Houston
ORTHOPHOSPHATE PHOSPHORUS, DISS, MG/L, FILTER >15MIN	mg/L	water	EPA 365.1	70507	0.04	0.005 (lake) 0.02 (tribs) *****	70-130	20	80-120	Eurofins Xenco-Houston
BROMIDE (MG/L AS BR)	mg/L	water	EPA 300.0 Rev. 2.0 (1993)	71870	NA	0.5	70-130	20	80-120	Eurofins Xenco-Houston
Metals in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
CALCIUM, TOTAL (MG/L AS CA)	mg/L	water	EPA 200.7 Rev 4.4 (1994)	00916	0.5	0.2	70-130	20	80-120	Eurofins Xenco-Houston
MAGNESIUM, TOTAL (MG/L AS MG)	mg/L	water	EPA 200.8 Rev 5.4 (1998)	00927	0.5	0.1	70-130	20	80-120	Eurofins Xenco-Houston
SODIUM, TOTAL (MG/L AS NA)	mg/L	water	EPA 200.8 Rev 5.4 (1998)	00929	NA	0.5	70-130	20	80-120	Eurofins Xenco-Houston
POTASSIUM, TOTAL (MG/L AS K)	mg/L	water	EPA 200.7 Rev 4.4 (1994)	00937	NA	0.5	70-130	20	80-120	Eurofins Xenco-Houston
ARSENIC, DISSOLVED (UG/L AS AS)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01000	5	4	70-130	20	80-120	Eurofins Xenco-Houston
ARSENIC, TOTAL (UG/L AS AS)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01002	NA	4	70-130	20	80-120	Eurofins Xenco-Houston
CHROMIUM, DISSOLVED (UG/L AS CR)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01030	10	4	70-130	20	80-120	Eurofins Xenco-Houston

Metals in Water (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
IRON, TOTAL (UG/L AS FE)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01045	300	20	70-130	20	80-120	Eurofins Xenco-Houston
MANGANESE, TOTAL (UG/L AS MN)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01055	50	2	70-130	20	80-120	Eurofins Xenco-Houston

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** To be routinely reported when collecting data from perennial pools.
*** As published by the Texas Water Development Board on their website https://www.waterdatafortexas.org/reservoirs/statewide
**** 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 B5.
***** Tribs are defined as any stream or river site.
******Flow estimate is to be only used if flow measurement is unable to be taken (e.g. when staff safety is at risk).

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
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 A7.2 Measurement Performance Specifications for Lake Livingston Project

Field Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)*	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	SM 2550 B and TCEQ SOP V1	00020	NA*	NA	NA	NA	NA	Field
RESERVOIR ACCESS NOT POSSIBLE LEVEL TOO LOW ENTER 1 IF REPORTING	NS	other	TCEQ Drought Guidance	00051	NA*	NA	NA	NA	NA	Field
RESERVOIR STAGE (FEET ABOVE MEAN SEA LEVEL)***	FT ABOVE MSL	water	TWDB	00052	NA*	NA	NA	NA	NA	Field
RESERVOIR PERCENT FULL***	% RESERVOIR CAPACITY	water	TWDB	00053	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)*	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)*	µs/cm	water	EPA 120.1 and TCEQ SOP V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)*	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)*	s.u.	water	EPA 150.1 and TCEQ SOP V1	00400	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	NA*	NA	NA	NA	NA	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	NA*	NA	NA	NA	NA	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	NA*	NA	NA	NA	NA	Field
Flow Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	NA	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)******	cfs	water	TCEQ SOP V1	74069	NA	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	NA	NA	NA	NA	NA	Field

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	IDEXX Laboratories Colilert®	31699	1	1	NA	0.50 ****	NA	LLP
Conventional Parameters in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
ALKALINITY, TOTAL (MG/L AS CACO3)	mg/L	water	SM 2320 B	00410	20	20	70-130	20	80-120	LLP
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540 D	00530	5	2	NA	10	NA	LLP
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	SM 4500-NH3 D	00610	0.1	0.1	70-130	20	80-120	LLP
NITRITE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00615	0.05	0.04	70-130	10	90-110	LLP
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	0.05	0.04	70-130	10	90-110	LLP
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2	00625	0.2	0.2	70-130	20	80-120	RS&C
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	SM 4500-P E	00665	0.06	0.04	70-130	20	80-120	LLP
ORTHOPHOSPHATE PHOSPHORUS, DISS, MG/L, FLDFIL T<15MIN	mg/L	water	SM 4500-P E	00671	0.04	0.04	70-130	20	80-120	LLP
HARDNESS, TOTAL (MG/L AS CACO3)*****	mg/L	water	SM 2340 C	00900	5	5	70-130	20	80-120	LLP
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	5	70-130	10	90-110	LLP
SULFATE (MG/L AS SO4)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00945	5	5	70-130	10	90-110	LLP
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	µg/L	water	SM 10200 H	32211	3	3	70-130	20	NA	LLP
RESIDUE, TOTAL FILTRABLE (DRIED AT 180C) (MG/L)	mg/L	water	SM 2540 C	70300	10	10	NA	10	NA	LLP
Metals in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
ARSENIC, DISSOLVED (UG/L AS AS)	µg/L	water	SM 3113 B	01000	5	3	70-130	20	85-115	LLP
CADMIUM, DISSOLVED (UG/L AS CD)	µg/L	water	SM 3113 B	01025	0.1 for waters <50mg/L hardness ------- 0.3 for waters >50mg/L hardness	0.3	70-130	20	85-115	LLP

Metals in Water (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
CHROMIUM, DISSOLVED (UG/L AS CR)	µg/L	water	SM 3113 B	01030	10	10	70-130	20	85-115	LLP
COPPER, DISSOLVED (UG/L AS CU)	µg/L	water	SM 3113 B	01040	1 for waters <50mg/L hardness ------- 3 for waters >=50mg/L hardness	3	70-130	20	85-115	LLP
IRON, DISSOLVED (UG/L)	µg/L	water	SM 3111 B	01046	NA	50	70-130	20	85-115	LLP
LEAD, DISSOLVED (UG/L AS PB)	µg/L	water	SM 3113 B	01049	0.1 for waters <85 mg/L hardness ------- 1 for waters >=85 mg/L hardness	1	70-130	20	85-115	LLP
MANGANESE, DISSOLVED (UG/L AS MN)	µg/L	water	SM 3111 B	01056	NA	30	70-130	20	85-115	LLP
NICKEL, DISSOLVED (UG/L AS NI)	µg/L	water	SM 3111 B	01065	10	10	70-130	20	85-115	LLP
SILVER, DISSOLVED (UG/L AS AG)	µg/L	water	SM 3113 B	01075	0.5	0.5	70-130	20	85-115	LLP
ZINC, DISSOLVED (UG/L AS ZN)	µg/L	water	SM 3111 B	01090	5	5	70-130	20	85-115	LLP
ALUMINUM, DISSOLVED (UG/L AS AL)	µg/L	water	SM 3111 D	01106	200	200	70-130	20	85-115	LLP
SELENIUM, TOTAL (UG/L AS SE)	µg/L	water	SM 3113 B	01147	2	2	70-130	20	85-115	LLP

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** To be routinely reported when collecting data from perennial pools.
*** As published by the Texas Water Development Board on their website https://www.waterdatafortexas.org/reservoirs/statewide
**** 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 B5.
***** Hardness is not used for regulatory purposes but is used to assess metals in water at inland sites (estuarine sites do not require hardness analysis).
****** Flow estimate is to be only used if flow measurement is unable to be taken (e.g., when staff safety is at risk).

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
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 A7.3 Measurement Performance Specifications for City of Arlington

Field Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)*	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	SM 2550 B and TCEQ SOP V1	00020	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)*	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)*	µs/cm	water	EPA 120.1 and TCEQ SOP V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)*	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)*	s.u.	water	EPA 150.1 and TCEQ SOP V1	00400	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	NA*	NA	NA	NA	NA	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	NA*	NA	NA	NA	NA	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	NA*	NA	NA	NA	NA	Field
Flow Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5= High,6=Dry	NU	water	TCEQ SOP V1	01351	NA	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)*****	cfs	Water	TCEQ SOP V1	74069	NA	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	NA	NA	NA	NA	NA	Field
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	IDEXX Laboratories Colilert®/ Colilert®-18	31699	1	1	NA	0.50 ***	NA	RS&C

Conventional Parameters in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
NITRITE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00615	0.05	0.05	70-130	20	80-120	RS&C
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	0.05	0.05	70-130	20	80-120	RS&C
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2	00625	0.2	0.2	70-130	20	80-120	RS&C
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.1	00665	0.06	0.02	70-130	20	80-120	RS&C
HARDNESS, TOTAL (MG/L AS CACO3)****	mg/L	water	SM 2340 C	00900	5	5	NA	20	80-120	RS&C
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	µg/L	water	SM 10200 H	32211	3	3	NA	20	80-120	RS&C
ORTHOPHOSPHATE PHOSPHORUS, DISS, MG/L, FILTER >15MIN	mg/L	water	SM 4500-P F	70507	0.04	0.02	70-130	20	80-120	RS&C
Metals in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
CADMIUM, DISSOLVED (UG/L AS CD)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01025	0.1 for waters <50mg/L hardness ------- 0.3 for waters >50mg/L hardness	0.3	70-130	20	80-120	AR
CHROMIUM, DISSOLVED (UG/L AS CR)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01030	10	1	70-130	20	80-120	AR
COPPER, DISSOLVED (UG/L AS CU)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01040	1 for waters <50mg/L hardness ------- 3 for waters >=50mg/L hardness	1	70-130	20	80-120	AR
IRON, DISSOLVED (UG/L)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01046	NA	100	70-130	20	80-120	AR
LEAD, DISSOLVED (UG/L AS PB)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01049	0.1 for waters <85 mg/L hardness ------- 1 for waters >=85 mg/L hardness	1	70-130	20	80-120	AR
MANGANESE, DISSOLVED (UG/L AS MN)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01056	NA	1	70-130	20	80-120	AR
NICKEL, DISSOLVED (UG/L AS NI)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01065	10	1	70-130	20	80-120	AR
ZINC, DISSOLVED (UG/L AS ZN)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01090	5	5	70-130	20	80-120	AR

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** To be routinely reported when collecting data from perennial pools.
*** 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 B5.
**** Hardness is not used for regulatory purposes but is used to assess metals in water at inland sites (estuarine sites do not require hardness analysis).
***** Flow estimate is to be only used if flow measurement is unable to be taken (e.g., when staff safety is at risk).

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79- 020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
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 A7.4 Measurement Performance Specifications for City of Dallas (Collecting Entity Code DA)

Field Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)*	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	SM 2550 B and TCEQ SOP V1	00020	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)*	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)*	µs/cm	water	EPA 120.1 and TCEQ SOP V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)*	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)*	s.u.	water	EPA 150.1 and TCEQ SOP V1	00400	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	other	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
Flow Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	NA	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)*****	cfs	Water	TCEQ SOP V1	74069	NA	NA	NA	NA	NA	Field
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	IDEXX Laboratories Colilert®	31699	1	1	NA	0.50 **	NA	Eurofins Xenco-Dallas
E. COLI, COLILERT, IDEXX, HOLDING TIME	hours	water	NA	31704	NA	NA	NA	NA	NA	Eurofins Xenco-Dallas
Conventional Parameters in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
BIOCHEMICAL OXYGEN DEMAND (MG/L, 5 DAY - 20DEG C	mg/L	water	SM 5210B	00310	2	2	NA	NA	NA	Dallas PALS
ALKALINITY, TOTAL (MG/L AS CACO3)	mg/L	water	SM 2320B	00410	20	20	NA	20	NA	Dallas PALS
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540D	00530	5	2	NA	NA	NA	Dallas PALS
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.1 Rev. 2.0 (1993)	00610	0.1	0.1	70-130	20	80-120	Dallas PALS
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	0.05	0.05	70-130	20	80-120	Dallas PALS

Conventional Parameters in Water (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	SM 4500-P E	00665	0.06	0.05	70-130	20	80-120	Dallas PALS
CARBON, TOTAL ORGANIC, NPOC (TOC), MG/L	mg/L	water	SM 5310 B	00680	2	1	NA	NA	NA	Dallas PALS
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	0.5	70-130	20	80-120	Dallas PALS
RESIDUE, TOTAL FILTRABLE (DRIED AT 180C) (MG/L)	mg/L	water	SM 2540 C	70300	10	5	NA	20	80-120	Dallas PALS
ORTHOPHOSPHATE PHOSPHORUS, DISS, MG/L, FILTER >15MIN	mg/L	water	EPA 365.1	70507	0.04	0.02	70-130	20	80-120	Dallas PALS
PHYTOPLANKTON DENSITY, TOTAL (CELLS/ML)	CELLS/ ML	Other	N/A Calculation	95999	NA	NA	NA	NA	NA	Eurofins Xenco-Dallas
Metals in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
ARSENIC, DISSOLVED (UG/L AS AS)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01000	5	5	70-130	20	80-120	RS&C
BARIUM, DISSOLVED (UG/L AS BA)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01005	1000	1	70-130	20	80-120	RS&C
BARIUM, DISSOLVED (UG/L AS BA)******	µg/L	water	EPA 200.7 Rev 4.4 (1994)	01005	1000	100	70-130	20	85-115	RS&C
CADMIUM, DISSOLVED (UG/L AS CD)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01025	0.1 for waters <50mg/L hardness ------- 0.3 for waters >50mg/L hardness	0.3	70-130	20	80-120	RS&C
CHROMIUM, DISSOLVED (UG/L AS CR)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01030	10	5	70-130	20	80-120	RS&C
COPPER, DISSOLVED (UG/L AS CU)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01040	1 for waters <50mg/L hardness ------- 3 for waters >=50mg/L hardness	1	70-130	20	80-120	RS&C

Metals in Water (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
LEAD, DISSOLVED (UG/L AS PB)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01049	0.1 for waters <85 mg/L hardness ------- 1 for waters>=85 mg/L hardness	1	70-130	20	80-120	RS&C
NICKEL, DISSOLVED (UG/L AS NI)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01065	10	1	70-130	20	80-120	RS&C
SILVER, DISSOLVED (UG/L AS AG)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01075	0.5	0.3	70-130	20	80-120	RS&C
ZINC, DISSOLVED (UG/L AS ZN)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01090	5	5	70-130	20	80-120	RS&C
ALUMINUM, DISSOLVED (UG/L AS AL)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01106	200	50	70-130	20	80-120	RS&C
ALUMINUM, DISSOLVED (UG/L AS AL)	µg/L	water	EPA 200.7 Rev 4.4 (1994)	01106	200	100	70-130	20	85-115	RS&C
SELENIUM, DISSOLVED (UG/L AS SE)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01145	NA	5	70-130	20	80-120	RS&C
SELENIUM, DISSOLVED (UG/L AS SE)	µg/L	water	EPA 200.7 Rev 4.4 (1994)	01145	NA	50	70-130	20	85-115	RS&C

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** 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 B5.
*** 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.
**** Hardness is not used for regulatory purposes but is used to assess metals in water at inland sites (estuarine sites do not require hardness analysis).
***** Flow estimate is to be only used if flow measurement is unable to be taken (e.g., when staff safety is at risk).
******Partner notes that no data will be submitted using method 200.7 until the instrument receives NELAP accreditation.

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
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 A7.5 Measurement Performance Specifications for Trinity River Authority

Field Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)*	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	SM 2550 B and TCEQ SOP V1	00020	NA*	NA	NA	NA	NA	Field
RESERVOIR ACCESS NOT POSSIBLE LEVEL TOO LOW ENTER 1 IF REPORTING	NS	other	TCEQ Drought Guidance	00051	NA*	NA	NA	NA	NA	Field
RESERVOIR STAGE (FEET ABOVE MEAN SEA LEVEL)***	FT ABOVE MSL	water	TWDB	00052	NA*	NA	NA	NA	NA	Field
RESERVOIR PERCENT FULL***	% RESERVOIR CAPACITY	water	TWDB	00053	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)*	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)*	µs/cm	water	EPA 120.1 and TCEQ SOP V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)*	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)*	s.u.	water	EPA 150.1and TCEQ SOP V1	00400	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	NA*	NA	NA	NA	NA	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	NA*	NA	NA	NA	NA	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	NA*	NA	NA	NA	NA	Field
24 Hour Parameters in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE), 24HR AVG	DEG C	Water	TCEQ SOP V1	00209	NA	NA	NA	NA	NA	Field
WATER TEMPERATURE, DEGREES CENTIGRADE, 24HR MAX	DEG C	Water	TCEQ SOP V1	00210	NA	NA	NA	NA	NA	Field

24 Hour Parameters in Water (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE) 24HR MIN	DEG C	Water	TCEQ SOP V1	00211	NA	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR AVG	µS/cm	Water	TCEQ SOP V1	00212	NA	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MAX	µS/cm	Water	TCEQ SOP V1	00213	NA	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MIN	µS/cm	Water	TCEQ SOP V1	00214	NA	NA	NA	NA	NA	Field
PH, S.U., 24HR MAXIMUM VALUE	std. units	Water	TCEQ SOP V1	00215	NA	NA	NA	NA	NA	Field
PH, S.U., 24HR, MINIMUM VALUE	std. units	Water	TCEQ SOP V1	00216	NA	NA	NA	NA	NA	Field
WATER TEMPERATURE, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00221	NA	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00222	NA	NA	NA	NA	NA	Field
pH, # OF MEASUREMENTS IN 24- HRS	NU	Water	TCEQ SOP V1	00223	NA	NA	NA	NA	NA	Field
DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89855	NA	NA	NA	NA	NA	Field
DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89856	NA	NA	NA	NA	NA	Field
DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89857	NA	NA	NA	NA	NA	Field
DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	89858	NA	NA	NA	NA	NA	Field
Flow Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=H igh,6=Dry	NU	water	TCEQ SOP V1	01351	NA	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)*******	cfs	Water	TCEQ SOP V1	74069	NA	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	NA	NA	NA	NA	NA	Field
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	IDEXX Laboratories Colilert®/ Colilert®-18	31699	1	1	NA	0.50 ****	NA	RS&C

Conventional Parameters in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
ALKALINITY, TOTAL (MG/L AS CACO3)	mg/L	water	SM 2320 B	00410	20	20	NA	20	NA	RS&C
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540 D	00530	5	2	NA	NA	NA	RS&C
RESIDUE, VOLATILE NONFILTRABLE (MG/L)	mg/L	water	EPA 160.4	00535	5	2	NA	NA	NA	RS&C
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	SM 4500-NH3 H	00610	0.1	0.02	70-130	20	80-120	RS&C
NITRITE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00615	0.05	0.05	70-130	20	80-120	RS&C
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	0.05	0.05	70-130	20	80-120	RS&C
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2	00625	0.2	0.2	70-130	20	80-120	RS&C
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.1	00665	0.06	0.02	70-130	20	80-120	RS&C
CARBON, TOTAL ORGANIC, NPOC (TOC), MG/L	mg/L	water	SM 5310 C	00680	2	0.5	NA	NA	NA	RS&C
HARDNESS, TOTAL (MG/L AS CACO3)*****	mg/L	water	SM 2340 C	00900	5	5	NA	20	80-120	RS&C
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	2	70-130	20	80-120	RS&C
SULFATE (MG/L AS SO4)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00945	5	2	70-130	20	80-120	RS&C
FLUORIDE, TOTAL (MG/L AS F)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00951	0.5	0.1	70-130	20	80-120	RS&C
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	µg/L	water	SM 10200 H	32211	3	3	NA	20	80-120	RS&C
PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH.	µg/L	water	SM 10200 H	32218	3	3	NA	NA	NA	RS&C
RESIDUE, TOTAL FILTRABLE (DRIED AT 180C) (MG/L)	mg/L	water	SM 2540 C	70300	10	10	NA	20	80-120	RS&C
ORTHOPHOSPHATE PHOSPHORUS, DISS, MG/L, FILTER >15MIN	mg/L	water	SM 4500-P F	70507	0.04	0.02	70-130	20	80-120	RS&C
Metals in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
ARSENIC, DISSOLVED (UG/L AS AS)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01000	5	5	70-130	20	80-120	RS&C
CADMIUM, DISSOLVED (UG/L AS CD)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01025	0.1 for waters <50mg/L hardness ------- 0.3 for waters >50mg/L hardness	0.3	70-130	20	80-120	RS&C

Metals in Water (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
CHROMIUM, DISSOLVED (UG/L AS CR)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01030	10	5	70-130	20	80-120	RS&C
COPPER, DISSOLVED (UG/L AS CU)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01040	1 for waters <50mg/L hardness ------- 3 for waters >=50mg/L hardness	1	70-130	20	80-120	RS&C
IRON, DISSOLVED (UG/L)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01046	NA	50	70-130	20	80-120	RS&C
IRON, DISSOLVED (UG/L)	µg/L	water	EPA 200.7 Rev 4.4 (1994)	01046	NA	100	70-130	20	85-115	RS&C
LEAD, DISSOLVED (UG/L AS PB)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01049	0.1 for waters <85 mg/L hardness ------- 1 for waters >=85 mg/L hardness	1	70-130	20	80-120	RS&C
NICKEL, DISSOLVED (UG/L AS NI)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01065	10	1	70-130	20	80-120	RS&C
ZINC, DISSOLVED (UG/L AS ZN)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01090	5	5	70-130	20	80-120	RS&C
ALUMINUM, DISSOLVED (UG/L AS AL)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01106	200	50	70-130	20	80-120	RS&C
ALUMINUM, DISSOLVED (UG/L AS AL)	µg/L	water	EPA 200.7 Rev 4.4 (1994)	01106	200	100	70-130	20	85-115	RS&C
Field Parameters for Aquatic Life Monitoring										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)*	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	SM 2550 B and TCEQ SOP V1	00020	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)*	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)*	µs/cm	water	EPA 120.1 and TCEQ SOP V1	00094	NA*	NA	NA	NA	NA	Field

Field Parameters for Aquatic Life Monitoring (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
OXYGEN, DISSOLVED (MG/L)*	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)*	s.u	water	EPA 150.1and TCEQ SOP V1	00400	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
WIND INTENSITY (1=CALM,2=SLIGHT,3=MOD.,4=STRONG)	NU	other	NA	89965	NA	NA	NA	NA	NA	Field
PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=CLDY,4=RAIN,5=OTHER)	NU	other	NA	89966	NA	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	NA	NA	NA	NA	NA	Field
24 Hour Parameters in Water for Aquatic Life Monitoring										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE), 24HR AVG	DEG C	Water	TCEQ SOP V1	00209	NA	NA	NA	NA	NA	Field
WATER TEMPERATURE, DEGREES CENTIGRADE, 24HR MAX	DEG C	Water	TCEQ SOP V1	00210	NA	NA	NA	NA	NA	Field
TEMPERATURE, WATER (DEGREES CENTIGRADE) 24HR MIN	DEG C	Water	TCEQ SOP V1	00211	NA	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR AVG	µS/cm	Water	TCEQ SOP V1	00212	NA	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MAX	µS/cm	Water	TCEQ SOP V1	00213	NA	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, US/CM, FIELD, 24HR MIN	µS/cm	Water	TCEQ SOP V1	00214	NA	NA	NA	NA	NA	Field
PH, S.U., 24HR MAXIMUM VALUE	std. units	Water	TCEQ SOP V1	00215	NA	NA	NA	NA	NA	Field
PH, S.U., 24HR, MINIMUM VALUE	std. units	Water	TCEQ SOP V1	00216	NA	NA	NA	NA	NA	Field
WATER TEMPERATURE, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00221	NA	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	00222	NA	NA	NA	NA	NA	Field
pH, # OF MEASUREMENTS IN 24- HRS	NU	Water	TCEQ SOP V1	00223	NA	NA	NA	NA	NA	Field
DISSOLVED OXYGEN, 24-HOUR MIN. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89855	NA	NA	NA	NA	NA	Field
DISSOLVED OXYGEN, 24-HOUR MAX. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89856	NA	NA	NA	NA	NA	Field
DISSOLVED OXYGEN, 24-HOUR AVG. (MG/L) MIN. 4 MEA	mg/l	Water	TCEQ SOP V1	89857	NA	NA	NA	NA	NA	Field

24 Hour Parameters in Water for Aquatic Life Monitoring (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
DISSOLVED OXYGEN, # OF MEASUREMENTS IN 24-HRS	NU	Water	TCEQ SOP V1	89858	NA	NA	NA	NA	NA	Field
Habitat Parameters for Aquatic Life Monitoring										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
BIOLOGICAL DATA	NS	Other	NA/Calculation	89888	NA	NA	NA	NA	NA	Field
STREAM TYPE; 1=PERENNIAL 2=INTERMITTENTS/PERENNIAL POOLS 3=INTERMITTENT 4=UNKNOWN	NU	Water	NA/Calculation	89821	NA	NA	NA	NA	NA	Field
STREAM ORDER	NU	Water	TCEQ SOP V2	84161	NA	NA	NA	NA	NA	Field
STREAMBED SLOPE (M/KM)	M/KM	Other	NA/Calculation	72051	NA	NA	NA	NA	NA	Field
DRAINAGE AREA ABOVE MOST DOWNSTREAM TRANSECT******	km2	Other	TCEQ SOP V2	89859	NA	NA	NA	NA	NA	Field
REACH LENGTH OF STREAM EVALUATED (M)	m	Other	NA/Calculation	89884	NA	NA	NA	NA	NA	Field
ECOREGION LEVEL III (TEXAS ECOREGION CODE)	NU	Other	TCEQ SOP V1	89961	NA	NA	NA	NA	NA	Field
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	Water	TCEQ SOP V2	00061	NA	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	Other	TCEQ SOP V2	89835	NA	NA	NA	NA	NA	Field
HABITAT FLOW STATUS, 1=NO FLOW, 2=LOW,3=MOD,4=HIGH	NU	Other	TCEQ SOP V2	89848	NA	NA	NA	NA	NA	Field
NUMBER OF LATERAL TRANSECTS MADE	NU	Other	TCEQ SOP V2	89832	NA	NA	NA	NA	NA	Field
NUMBER OF WELL DEFINED STREAM BENDS	NU	Other	TCEQ SOP V2	89840	NA	NA	NA	NA	NA	Field
NUMBER OF MODERATELY DEFINED STREAM BENDS	NU	Other	TCEQ SOP V2	89841	NA	NA	NA	NA	NA	Field
NUMBER OF POORLY DEFINED STREAM BENDS	NU	Other	TCEQ SOP V2	89842	NA	NA	NA	NA	NA	Field
TOTAL NUMBER OF RIFFLES	NU	Other	TCEQ SOP V2	89843	NA	NA	NA	NA	NA	Field
AVERAGE PERCENTAGE INSTREAM COVER	%	Other	TCEQ SOP V2	84159	NA	NA	NA	NA	NA	Field
TOTAL NUMBER OF STREAM BENDS	NU	Other	TCEQ SOP V2	89839	NA	NA	NA	NA	NA	Field
AESTHETICS OF REACH (1=WILD 2=NAT. 3=COMM. 4=OFF.)	NU	Other	TCEQ SOP V2	89867	NA	NA	NA	NA	NA	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	NA	NA	NA	NA	NA	Field
AVERAGE PERCENT OF SUBSTRATE GRAVEL SIZE OR LARGER	%	Other	TCEQ SOP V2	89845	NA	NA	NA	NA	NA	Field
AVERAGE STREAM BANK EROSION (%)	%	Other	TCEQ SOP V2	89846	NA	NA	NA	NA	NA	Field

Habitat Parameters for Aquatic Life Monitoring (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
AVERAGE STREAM BANK SLOPE (DEGREES)	deg	Other	TCEQ SOP V2	89847	NA	NA	NA	NA	NA	Field
NUMBER OF STREAM COVER TYPES	NU	Other	TCEQ SOP V2	89929	NA	NA	NA	NA	NA	Field
AVERAGE STREAM WIDTH (METERS)	M	Other	TCEQ SOP V2	89861	NA	NA	NA	NA	NA	Field
AVERAGE STREAM DEPTH (METERS)	M	Other	TCEQ SOP V2	89862	NA	NA	NA	NA	NA	Field
AVERAGE PERCENTAGE OF TREE CANOPY COVERAGE	%	Other	TCEQ SOP V2	89854	NA	NA	NA	NA	NA	Field
RIPARIAN VEGETATION %; LEFT BANK - TREES	%	Other	NA/Calculation	89822	NA	NA	NA	NA	NA	Field
RIPARIAN VEGETATION %; RIGHT BANK - TREES	%	Other	NA/Calculation	89823	NA	NA	NA	NA	NA	Field
AVERAGE PERCENT TREES AS RIPARIAN VEGETATION	%	Other	TCEQ SOP V2	89849	NA	NA	NA	NA	NA	Field
RIPARIAN VEGETATION %; LEFT BANK SHRUBS	%	Other	NA/Calculation	89824	NA	NA	NA	NA	NA	Field
RIPARIAN VEGETATION %; RIGHT BANK - SHRUBS	%	Other	NA/Calculation	89825	NA	NA	NA	NA	NA	Field
AVERAGE PERCENT SHRUBS AS RIPARIAN VEGETATION	%	Other	TCEQ SOP V2	89850	NA	NA	NA	NA	NA	Field
RIPARIAN VEGETATION %: LEFT BANK - GRASSES OR FORBS	%	Other	NA/Calculation	89826	NA	NA	NA	NA	NA	Field
RIPARIAN VEGETATION %; RIGHT BANK - GRASSES OR FORBS	%	Other	NA/Calculation	89827	NA	NA	NA	NA	NA	Field
AVERAGE PERCENT GRASS AS RIPARIAN VEGETATION	%	Other	TCEQ SOP V2	89851	NA	NA	NA	NA	NA	Field
RIPARIAN VEGETATION %: LEFT BANK - CULTIVATED FIELDS	%	Other	NA/Calculation	89828	NA	NA	NA	NA	NA	Field
RIPARIAN VEGETATION %: RIGHT BANK - CULTIVATED FIELDS	%	Other	NA/Calculation	89829	NA	NA	NA	NA	NA	Field
AVERAGE PERCENT CULTIVATED FIELDS AS RIPARIAN VEGETATION	%	Other	TCEQ SOP V2	89852	NA	NA	NA	NA	NA	Field
RIPARIAN VEGETATION %: LEFT BANK - OTHER	%	Other	NA/Calculation	89830	NA	NA	NA	NA	NA	Field
RIPARIAN VEGETATION %: RIGHT BANK - OTHER	%	Other	NA/Calculation	89871	NA	NA	NA	NA	NA	Field
AVERAGE PERCENT OTHER AS RIPARIAN VEGETATION	%	Other	TCEQ SOP V2	89853	NA	NA	NA	NA	NA	Field
AVERAGE WIDTH OF NATURAL RIPARIAN BUFFER ON LEFT BANK (M)	M	Other	NA/Calculation	89872	NA	NA	NA	NA	NA	Field
AVERAGE WIDTH OF NATURAL RIPARIAN BUFFER ON RIGHT BANK (M)	m	Other	NA/Calculation	89873	NA	NA	NA	NA	NA	Field
AVERAGE WIDTH OF NATURAL RIPARIAN VEGETATION (M)	M	Other	TCEQ SOP V2	89866	NA	NA	NA	NA	NA	Field
LAND DEVELOP IMPACT (1=UNIMP,2=LOW,3=MOD,4=HIGH)	NU	Other	TCEQ SOP V2	89962	NA	NA	NA	NA	NA	Field
AVAILABLE INSTREAM COVER HQI SCORE: 4=ABUNDANT 3=COMMON 2=RARE 1=ABSENT	NU	Other	NA/Calculation	89874	NA	NA	NA	NA	NA	Field

Habitat Parameters for Aquatic Life Monitoring (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
BOTTOM SUBSTRATE STABILITY HQI SCORE: 4=STABLE 3=MODERATELY STABLE 2=MODERATELY UNSTABLE 1=UNSTABLE	NU	Other	NA/Calculation	89875	NA	NA	NA	NA	NA	Field
NUMBER OF RIFFLES HQI SCORE: 4=ABUNDANT 3=COMMON 2=RARE 1=ABSENT	NS	Other	NA/Calculation	89876	NA	NA	NA	NA	NA	Field
DIMENSIONS OF LARGEST POOL HQI SCORE: 4=LARGE 3=MODERATE 2=SMALL 1=ABSENT	NU	Other	NA/Calculation	89877	NA	NA	NA	NA	NA	Field
CHANNEL FLOW STATUS HQI SCORE: 3=HIGH 2=MODERATE 1=LOW 0=NO FLOW	NU	Other	NA/Calculation	89878	NA	NA	NA	NA	NA	Field
BANK STABILITY HQI SCORE: 3=STABLE 2=MODERATELY STABLE 1=MODERATELY UNSTABLE 0=UNSTABLE	NU	Other	NA/Calculation	89879	NA	NA	NA	NA	NA	Field
CHANNEL SINUOSITY HQI SCORE: 3=HIGH 2=MODERATE 1=LOW 0=NONE	NU	Other	NA/Calculation	89880	NA	NA	NA	NA	NA	Field
RIPARIAN BUFFER VEGETATION HQI SCORE: 3=EXTENSIVE 2=WIDE 1=MODERATE 0=NARROW	NU	Other	NA/Calculation	89881	NA	NA	NA	NA	NA	Field
AESTHETICS OF REACH HQI SCORE: 3=WILDERNESS 2=NATURAL AREA 1=COMMON SETTING 0=OFFENSIVE	NU	Other	NA/Calculation	89882	NA	NA	NA	NA	NA	Field
HQI TOTAL SCORE	NU	Other	NA/Calculation	89883	NA	NA	NA	NA	NA	Field
UNDERCUT BANK AT COLLECTION POINT (%)	%	Other	N/A Calculation	89921	NA	NA	NA	NA	NA	Field
OVERHANGING BRUSH AT COLLECTION POINT (%)	%	Other	N/A Calculation	89922	NA	NA	NA	NA	NA	Field
GRAVEL BOTTOM AT COLLECTION POINT (%)	%	Sediment	N/A Calculation	89923	NA	NA	NA	NA	NA	Field
SAND BOTTOM AT COLLECTION POINT (%)	%	Sediment	N/A Calculation	89924	NA	NA	NA	NA	NA	Field
SOFT BOTTOM AT COLLECTION POINT (%)	%	Sediment	N/A Calculation	89925	NA	NA	NA	NA	NA	Field
MACROPHYTE BED AT COLLECTION POINT (%)	%	Other	N/A Calculation	89926	NA	NA	NA	NA	NA	Field
SNAGS AND BRUSH AT COLLECTION POINT (%)	%	Other	N/A Calculation	89927	NA	NA	NA	NA	NA	Field
BEDROCK STREAMBED AT COLLECTION POINT (%)	%	Sediment	N/A Calculation	89928	NA	NA	NA	NA	NA	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)	M	Other	TCEQ SOP V2	89864	NA	NA	NA	NA	NA	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)	M	Other	TCEQ SOP V2	89865	NA	NA	NA	NA	NA	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	NA*	NA	NA	NA	NA	Field

Habitat Parameters for Aquatic Life Monitoring (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	NA*	NA	NA	NA	NA	Field
NO FLOW ISOLATED POOL: LARGEST POOL MAX WIDTH (M)	M	Other	NA/Calculation	89908	NA	NA	NA	NA	NA	Field
NO FLOW ISOLATED POOL: LARGEST POOL MAX LENGTH (M)	M	Other	NA/Calculation	89909	NA	NA	NA	NA	NA	Field
NO FLOW ISOLATED POOL: LARGEST POOL MAX DEPTH (M)	M	Other	NA/Calculation	89910	NA	NA	NA	NA	NA	Field
NO FLOW ISOLATED POOL: SMALLEST POOL MAX DEPTH (M)	M	Other	NA/Calculation	89911	NA	NA	NA	NA	NA	Field
NO FLOW ISOLATED POOL: SMALLEST POOL MAX WIDTH (M)	M	Other	NA/Calculation	89912	NA	NA	NA	NA	NA	Field
NO FLOW ISOLATED POOL: SMALLEST POOL MAX LENGTH (M)	M	Other	NA/Calculation	89913	NA	NA	NA	NA	NA	Field
NO FLOW ISOLATED POOLS: NUMBER OF POOLS EVALUATED	NU	Other	NA/Calculation	89914	NA	NA	NA	NA	NA	Field
Qualitative Benthic Parameters for Aquatic Life Monitoring										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
BIOLOGICAL DATA	NS	Other	NA/Calculation	89888	NA	NA	NA	NA	NA	Field
STREAM ORDER	NU	Water	TCEQ SOP, V1	84161	NA	NA	NA	NA	NA	Field
ECOREGION LEVEL III (TEXAS ECOREGION CODE)	NU	Other	TCEQ SOP V1	89961	NA	NA	NA	NA	NA	Field
BENTHOS ORGANISMS -NONE PRESENT (0=NONE PRESENT)	NS	Other	TCEQ SOP V2	90005	NA	NA	NA	NA	NA	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	NA	NA	NA	NA	NA	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	NA	NA	NA	NA	NA	Field
DIP NET EFFORT, AREA SWEPT (SQ. METER)	m2	Other	TCEQ SOP V2	89902	NA	NA	NA	NA	NA	Field
DEBRIS/SHORELINE SAMPLING EFFORT, MINUTES	min.	Other	TCEQ SOP V2	89905	NA	NA	NA	NA	NA	Field
SURBER SAMPLER EFFORT, AREA SAMPLED (SQ. METER)	M2	Other	TCEQ SOP V2	89901	NA	NA	NA	NA	NA	Field
HESTER-DENDY DURATION (DAYS)	DAYS	Other	TCEQ SOP V2	89933	NA	NA	NA	NA	NA	Field
PETERSEN SAMPLER EFFORT, AREA SAMPLED (SQ. MTR.)	M2	Other	TCEQ SOP V2	89934	NA	NA	NA	NA	NA	Field
EKMAN SAMPLER EFFORT, AREA SAMPLED (SQ. METER)	M2	Other	TCEQ SOP V2	89935	NA	NA	NA	NA	NA	Field
AREA OF SNAG SURFACE SAMPLED (SQ.MT)	M2	Other	TCEQ SOP V2	89975	NA	NA	NA	NA	NA	Field

Qualitative Benthic Parameters for Aquatic Life Monitoring (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
KICKNET EFFORT, AREA KICKED (SQ. METER)	m2	Other	TCEQ SOP V2	89903	NA	NA	NA	NA	NA	Field
KICKNET EFFORT, MINUTES KICKED (MIN.)	min.	Other	TCEQ SOP V2	89904	NA	NA	NA	NA	NA	Field
MESH SIZE, ANY NET OR SIEVE, AVERAGE BAR (CM)	cm	Other	TCEQ SOP V2	89946	NA	NA	NA	NA	NA	Field
NUMBER OF INDIVIDUALS IN BENTHIC SAMPLE	NU	Other	TCEQ SOP V2	89906	NA	NA	NA	NA	NA	Field
UNDERCUT BANK AT COLLECTION POINT (%)	%	Other	TCEQ SOP V2	89921	NA	NA	NA	NA	NA	Field
OVERHANGING BRUSH AT COLLECTION POINT (%)	%	Other	TCEQ SOP V2	89922	NA	NA	NA	NA	NA	Field
GRAVEL BOTTOM AT COLLECTION POINT (%)	%	Sediment	TCEQ SOP V2	89923	NA	NA	NA	NA	NA	Field
SAND BOTTOM AT COLLECTION POINT (%)	%	Sediment	TCEQ SOP V2	89924	NA	NA	NA	NA	NA	Field
SOFT BOTTOM AT COLLECTION POINT (%)	%	Sediment	TCEQ SOP V2	89925	NA	NA	NA	NA	NA	Field
MACROPHYTE BED AT COLLECTION POINT (%)	%	Other	TCEQ SOP V2	89926	NA	NA	NA	NA	NA	Field
SNAGS AND BRUSH AT COLLECTION POINT (%)	%	Other	TCEQ SOP V2	89927	NA	NA	NA	NA	NA	Field
BEDROCK STREAMBED AT COLLECTION POINT (%)	%	Sediment	TCEQ SOP V2	89928	NA	NA	NA	NA	NA	Field
HILSENHOFF BIOTIC INDEX (HBI)	NU	Other	TCEQ SOP V2	90007	NA	NA	NA	NA	NA	Field
NUMBER OF EPT INDEX	NU	Other	TCEQ SOP V2	90008	NA	NA	NA	NA	NA	Field
DOMINANT BENTHIC FUNCTIONAL FEEDING GRP, % OF INDIVIDUALS	%	Other	TCEQ SOP V2	90010	NA	NA	NA	NA	NA	Field
BENTHIC GRAZERS, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90020	NA	NA	NA	NA	NA	Field
BENTHIC GATHERERS, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90025	NA	NA	NA	NA	NA	Field
BENTHIC FILTERERS, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90030	NA	NA	NA	NA	NA	Field
BENTHIC PREDATORS, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90036	NA	NA	NA	NA	NA	Field
DOMINANT TAXON, BENTHOS PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90042	NA	NA	NA	NA	NA	Field
RATIO OF INTOLERANT TO TOLERANT TAXA, BENTHOS	NU	Other	TCEQ SOP V2	90050	NA	NA	NA	NA	NA	Field
NUMBER OF NON-INSECT TAXA	NU	Other	TCEQ SOP V2	90052	NA	NA	NA	NA	NA	Field
ELMIDAE, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90054	NA	NA	NA	NA	NA	Field
TOTAL TAXA RICHNESS, BENTHOS	NU	Other	TCEQ SOP V2	90055	NA	NA	NA	NA	NA	Field
NUMBER OF DIPTERA TAXA	NU	Other	TCEQ SOP V2	90056	NA	NA	NA	NA	NA	Field
NUMBER OF EPHEMEROPTERA TAXA	NU	Other	TCEQ SOP V2	90057	NA	NA	NA	NA	NA	Field

Qualitative Benthic Parameters for Aquatic Life Monitoring (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TOTAL NUMBER OF INTOLERANT TAXA, BENTHOS	NU	Other	TCEQ SOP V2	90058	NA	NA	NA	NA	NA	Field
EPT, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90060	NA	NA	NA	NA	NA	Field
CHIRONOMIDAE, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90062	NA	NA	NA	NA	NA	Field
TOLERANT BENTHOS, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90066	NA	NA	NA	NA	NA	Field
DOMINANT 3 TAXA, PERCENT OF INDIVIDUALS	%	Other	TCEQ SOP V2	90067	NA	NA	NA	NA	NA	Field
PERCENT OF TOTAL TRICHOPTERA INDIVIDUALS AS HYDROPSYCHIDAE	%	Other	TCEQ SOP V2	90069	NA	NA	NA	NA	NA	Field
TOTAL # OF BENTHIC GENERA IN SAMPLE	NU	Other	TCEQ SOP V2	90011	NA	NA	NA	NA	NA	Field
BENTHIC SHREDDERS (% OF COMMUNITY)	%	Other	TCEQ SOP V2	90035	NA	NA	NA	NA	NA	Field
TOTAL # OF FAMILIES IN BENTHIC SAMPLE	NU	Other	TCEQ SOP V2	90012	NA	NA	NA	NA	NA	Field
RAPID BIOASSESSMENT PROTOCOLS BENTHIC MACROINVERTEBRATE IBI SCORE	NS	Other	NA/Calculation	90081	NA	NA	NA	NA	NA	Field
QUANTITATIVE PROTOCOLS REGIONAL BENTHIC MACROINVERTEBRATE IBI SCORE	NS	Other	NA/Calculation	90085	NA	NA	NA	NA	NA	Field
Species Enumeration	#	Benthics	NA/Calculation	Various	NA	NA	NA	NA	NA	WMS
Nekton Parameters for Aquatic Life Monitoring										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
BIOLOGICAL DATA	NS	Other	NA/Calculation	89888	NA	NA	NA	NA	NA	Field
STREAM ORDER	NU	Water	TCEQ SOP V1	84161	NA	NA	NA	NA	NA	Field
ECOREGION LEVEL III (TEXAS ECOREGION CODE)	NU	Other	TCEQ SOP V1	89961	NA	NA	NA	NA	NA	Field
NEKTON ORGANISMS-NONE PRESENT (0=NONE PRESENT)	NS	Other	TCEQ SOP V2	98005	NA	NA	NA	NA	NA	Field
SEINE, MINIMUM MESH SIZE, AVERAGE BAR, NEKTON, INCH	IN	Other	TCEQ SOP V2	89930	NA	NA	NA	NA	NA	Field
SEINE, MAXIMUM MESH SIZE, AVG BAR, NEKTON, INCH	IN	Other	TCEQ SOP V2	89931	NA	NA	NA	NA	NA	Field
NET LENGTH (METERS)	M	Other	TCEQ SOP V2	89941	NA	NA	NA	NA	NA	Field
ELECTROFISHING METHOD 1=BOAT 2=BACKPACK 3=TOTEBARGE	NU	Other	TCEQ SOP V2	89943	NA	NA	NA	NA	NA	Field
ELECTROFISH EFFORT, DURATION OF SHOCKING (SEC)	SEC	Other	TCEQ SOP V2	89944	NA	NA	NA	NA	NA	Field
SEINING EFFORT (# OF SEINE HAULS)	NU	Other	TCEQ SOP V2	89947	NA	NA	NA	NA	NA	Field
COMBINED LENGTH OF SEINE HAULS (METERS)	M	Other	TCEQ SOP V2	89948	NA	NA	NA	NA	NA	Field

Nekton Parameters for Aquatic Life Monitoring (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
SEINING EFFORT, DURATION (MINUTES)	MIN	Other	TCEQ SOP V2	89949	NA	NA	NA	NA	NA	Field
AREA SEINED (SQ METERS)	M2	Other	TCEQ SOP V2	89976	NA	NA	NA	NA	NA	Field
NUMBER OF SPECIES, FISH	NU	Other	TCEQ SOP V2	98003	NA	NA	NA	NA	NA	Field
TOTAL NUMBER OF SUNFISH SPECIES	NU	Other	TCEQ SOP V2	98008	NA	NA	NA	NA	NA	Field
TOTAL NUMBER OF INTOLERANT SPECIES, FISH	NU	Other	TCEQ SOP V2	98010	NA	NA	NA	NA	NA	Field
PERCENT OF INDIVIDUALS AS OMNIVORES, FISH	%	Other	TCEQ SOP V2	98017	NA	NA	NA	NA	NA	Field
PERCENT OF INDIVIDUALS AS INVERTIVORES, FISH	%	Other	TCEQ SOP V2	98021	NA	NA	NA	NA	NA	Field
PERCENT OF INDIVIDUALS AS PISCIVORES, FISH	%	Other	TCEQ SOP V2	98022	NA	NA	NA	NA	NA	Field
PERCENT OF INDIVIDUALS WITH DISEASE OR ANOMALY	%	Other	TCEQ SOP V2	98030	NA	NA	NA	NA	NA	Field
TOTAL NUMBER OF NATIVE CYPRINID SPECIES	NU	Other	TCEQ SOP V2	98032	NA	NA	NA	NA	NA	Field
PERCENT INDIVIDUALS AS NON-NATIVE FISH SPECIES (% OF COMMUNITY)	%	Other	TCEQ SOP V2	98033	NA	NA	NA	NA	NA	Field
TOTAL NUMBER OF INDIVIDUALS SEINING	NU	Other	TCEQ SOP V2	98039	NA	NA	NA	NA	NA	Field
TOTAL NUMBER OF INDIVIDUALS ELECTROFISHING	NU	Other	TCEQ SOP V2	98040	NA	NA	NA	NA	NA	Field
TOTAL NUMBER OF BENTHIC INVERTIVORE SPECIES	NU	Other	TCEQ SOP V2	98052	NA	NA	NA	NA	NA	Field
TOTAL NUMBER OF BENTHIC FISH SPECIES	NU	Other	TCEQ SOP V2	98053	NA	NA	NA	NA	NA	Field
NUMBER OF INDIVIDUALS PER SEINE HAUL	NU	Other	TCEQ SOP V2	98062	NA	NA	NA	NA	NA	Field
NUMBER OF INDIVIDUALS PER MINUTE ELECTROFISHING	NU	Other	TCEQ SOP V2	98069	NA	NA	NA	NA	NA	Field
PERCENT INDIVIDUALS AS TOLERANT FISH SPECIES (EXCLUDING WESTERN MOSQUITOFISH)	%	Other	TCEQ SOP V2	98070	NA	NA	NA	NA	NA	Field
TOTAL NUMBER OF SUCKER SPECIES	NU	Other	TCEQ SOP V2	98009	NA	NA	NA	NA	NA	Field
PERCENT OF INDIVIDUALS AS HYBRIDS	%	Other	TCEQ SOP V2	98024	NA	NA	NA	NA	NA	Field
TOTAL NUMBER OF INDIVIDUALS IN SAMPLE, FISH	NU	Other	TCEQ SOP V2	98023	NA	NA	NA	NA	NA	Field
PERCENT OF INDIVIDUALS AS TOLERANTS, FISH	%	Other	TCEQ SOP V2	98016	NA	NA	NA	NA	NA	Field
TOTAL NUMBER OF DARTER SPECIES	NU	Other	TCEQ SOP V2	98004	NA	NA	NA	NA	NA	Field
NEKTON TEXAS REGIONAL IBI SCORE	NS	Other	NA/Calculation	98123	NA	NA	NA	NA	NA	Field
Species Enumeration	#	Nekton	NA/Calculation	Various	NA	NA	NA	NA	NA	Field

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** To be routinely reported when collecting data from perennial pools.
*** As published by the Texas Water Development Board on their website https://www.waterdatafortexas.org/reservoirs/statewide
**** 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 B5.
***** Hardness is not used for regulatory purposes but is used to assess metals in water at inland sites (estuarine sites do not require hardness analysis).
****** From USGS map.
******* Flow estimate is to be only used if flow measurement is unable to be taken (e.g., when staff safety is at risk).

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
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 A7.6 Measurement Performance Specifications for City of Grand Prairie

Field Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)*	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	SM 2550 B and TCEQ SOP V1	00020	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)*	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)*	µs/cm	water	EPA 120.1 and TCEQ SOP V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)*	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)*	s.u.	water	EPA 150.1 and TCEQ SOP V1	00400	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	NA*	NA	NA	NA	NA	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	NA*	NA	NA	NA	NA	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	NA*	NA	NA	NA	NA	Field
Flow Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5= High,6=Dry	NU	water	TCEQ SOP V1	01351	NA	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)*****	cfs	Water	TCEQ SOP V1	74069	NA	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	NA	NA	NA	NA	NA	Field
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	IDEXX Laboratories Colilert®/ Colilert®-18	31699	1	1	NA	0.50 ***	NA	RS&C
Conventional Parameters in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
BIOCHEMICAL OXYGEN DEMAND (MG/L, 5 DAY - 20DEG C	mg/L	water	SM 5210 B	00310	2	2	NA	NA	NA	RS&C

Conventional Parameters in Water (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	SM 4500-NH3 H	00610	0.1	0.02	70-130	20	80-120	RS&C
NITRITE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00615	0.05	0.05	70-130	20	80-120	RS&C
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	0.05	0.05	70-130	20	80-120	RS&C
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2	00625	0.2	0.2	70-130	20	80-120	RS&C
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.1	00665	0.06	0.02	70-130	20	80-120	RS&C
HARDNESS, TOTAL (MG/L AS CACO3)****	mg/L	water	SM 2340 C	00900	5	5	NA	20	80-120	RS&C
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	2	70-130	20	80-120	RS&C
SULFATE (MG/L AS SO4)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00945	5	2	70-130	20	80-120	RS&C
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	µg/L	water	SM 10200 H	32211	3	3	NA	20	80-120	RS&C
RESIDUE, TOTAL FILTRABLE (DRIED AT 180C) (MG/L)	mg/L	water	SM 2540 C	70300	10	10	NA	20	80-120	RS&C
ORTHOPHOSPHATE PHOSPHORUS, DISS, MG/L, FILTER >15MIN	mg/L	water	SM 4500-P F	70507	0.04	0.02	70-130	20	80-120	RS&C
Metals in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
CADMIUM, DISSOLVED (UG/L AS CD)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01025	0.1 for waters <50mg/L hardness ------- 0.3 for waters >50mg/L hardness	0.3	70-130	20	80-120	RS&C
CADMIUM, TOTAL (UG/L AS CD)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01027	NA	5	70-130	20	80-120	RS&C
CADMIUM, TOTAL (UG/L AS CD)	µg/L	water	EPA 200.7 Rev 4.4 (1994)	01027	NA	50	70-130	20	85-115	RS&C
CHROMIUM, DISSOLVED (UG/L AS CR)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01030	10	5	70-130	20	80-120	RS&C
CHROMIUM, TOTAL (UG/L AS CR)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01034	NA	5	70-130	20	80-120	RS&C
CHROMIUM, TOTAL (UG/L AS CR)	µg/L	water	EPA 200.7 Rev 4.4 (1994)	01034	NA	50	70-130	20	85-115	RS&C
COPPER, DISSOLVED (UG/L AS CU)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01040	1 for waters <50mg/L hardness ------- 3 for waters >=50mg/L hardness	1	70-130	20	80-120	RS&C

Metals in Water (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
COPPER, TOTAL (UG/L AS CU)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01042	NA	5	70-130	20	80-120	RS&C
COPPER, TOTAL (UG/L AS CU)	µg/L	water	EPA 200.7 Rev 4.4 (1994)	01042	NA	50	70-130	20	85-115	RS&C
LEAD, DISSOLVED (UG/L AS PB)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01049	0.1 for waters <85 mg/L hardness ------- 1 for waters >=85 mg/L hardness	1	70-130	20	80-120	RS&C
LEAD, TOTAL (UG/L AS PB)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01051	NA	5	70-130	20	80-120	RS&C
LEAD, TOTAL (UG/L AS PB)	µg/L	water	EPA 200.7 Rev 4.4 (1994)	01051	NA	50	70-130	20	85-115	RS&C
ZINC, DISSOLVED (UG/L AS ZN)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01090	5	5	70-130	20	80-120	RS&C
ZINC, TOTAL (UG/L AS ZN)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01092	NA	5	70-130	20	80-120	RS&C
ZINC, TOTAL (UG/L AS ZN)	µg/L	water	EPA 200.7 Rev 4.4 (1994)	01092	NA	50	70-130	20	85-115	RS&C

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** To be routinely reported when collecting data from perennial pools.
*** 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 B5.
**** Hardness is not used for regulatory purposes but is used to assess metals in water at inland sites (estuarine sites do not require hardness analysis).
***** Flow estimate is to be only used if flow measurement is unable to be taken (e.g., when staff safety is at risk).

References:
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U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
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 A7.7 Measurement Performance Specifications for City of Fort Worth

Field Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)*	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	SM 2550 B and TCEQ SOP V1	00020	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)*	µs/cm	water	EPA 120.1 and TCEQ SOP V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)*	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)*	s.u.	water	EPA 150.1 and TCEQ SOP V1	00400	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)*	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	Meters	Water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
Flow Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	NA	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)****	cfs	Water	TCEQ SOP V1	74069	NA	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	NA	NA	NA	NA	NA	Field
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	0.50 **	NA	Eurofins Xenco-Dallas

* Reporting to be consistent with SWQM guidance and based on measurement capability.

** 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 B5.

*** Flow estimate is to be only used if flow measurement is unable to be taken (e.g., when staff safety is at risk).

References:

United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020

American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.

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 A7.8 Measurement Performance Specifications for City of Irving

Field Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)*	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	SM 2550 B and TCEQ SOP V1	00020	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)*	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)*	µs/cm	water	EPA 120.1 and TCEQ SOP V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)*	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)*	s.u.	water	EPA 150.1 and TCEQ SOP V1	00400	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	NA*	NA	NA	NA	NA	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	NA*	NA	NA	NA	NA	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	NA*	NA	NA	NA	NA	Field
Flow Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=H igh,6=Dry	NU	water	TCEQ SOP V1	01351	NA	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)*****	cfs	Water	TCEQ SOP V1	74069	NA	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	NA	NA	NA	NA	NA	Field
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	IDEXX Laboratories Colilert®/ Colilert®-18	31699	1	1	NA	0.50 ***	NA	RS&C
Conventional Parameters in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	SM 4500-NH3 H	00610	0.1	0.02	70-130	20	80-120	RS&C

Conventional Parameters in Water (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
NITRITE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00615	0.05	0.05	70-130	20	80-120	RS&C
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev.2.1 (1993)	00620	0.05	0.05	70-130	20	80-120	RS&C
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2	00625	0.2	0.2	70-130	20	80-120	RS&C
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.1	00665	0.06	0.02	70-130	20	80-120	RS&C
HARDNESS, TOTAL (MG/L AS CACO3)****	mg/L	water	SM 2340 C	00900	5	5	NA	20	80-120	RS&C
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	µg/L	water	SM 10200 H	32211	3	3	NA	20	80-120	RS&C
ORTHOPHOSPHATE PHOSPHORUS, DISS, MG/L, FILTER >15MIN	mg/L	water	SM 4500-P F	70507	0.04	0.02	70-130	20	80-120	RS&C
Metals in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
CADMIUM, DISSOLVED (UG/L AS CD)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01025	0.1 for waters <50mg/L hardness 0.3 for waters >50mg/L hardness	0.3	70-130	20	80-120	RS&C
CHROMIUM, DISSOLVED (UG/L AS CR)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01030	10	5	70-130	20	80-120	RS&C
COPPER, DISSOLVED (UG/L AS CU)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01040	1 for waters <50mg/L hardness 3 for waters >=50mg/L hardness	1	70-130	20	80-120	RS&C
LEAD, DISSOLVED (UG/L AS PB)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01049	0.1 for waters <85 mg/L hardness 1 for waters >=85 mg/L hardness	1	70-130	20	80-120	RS&C
ZINC, DISSOLVED (UG/L AS ZN)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01090	5	5	70-130	20	80-120	RS&C

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** To be routinely reported when collecting data from perennial pools.
*** 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 B5.
**** Hardness is not used for regulatory purposes but is used to assess metals in water at inland sites (estuarine sites do not require hardness analysis).
***** Flow estimate is to be only used if flow measurement is unable to be taken (e.g., when staff safety is at risk).

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
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 A7.9 Measurement Performance Specifications for City of Dallas (Collecting Entity Code DT)

Field Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)*	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	SM 2550 B and TCEQ SOP V1	00020	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)*	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)*	µs/cm	water	EPA 120.1 and TCEQ SOP V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)*	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)*	s.u.	water	EPA 150.1 and TCEQ SOP V1	00400	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	NA*	NA	NA	NA	NA	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	NA*	NA	NA	NA	NA	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	NA*	NA	NA	NA	NA	Field
Flow Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High, 6=Dry	NU	water	TCEQ SOP V1	01351	NA	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)****	cfs	Water	TCEQ SOP V1	74069	NA	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	NA	NA	NA	NA	NA	Field
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	IDEXX Laboratories Colilert®/ Colilert®-18	31699	1	1	NA	0.50 ***	NA	RS&C
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	IDEXX Laboratories Colilert®	31699	1	1	NA	0.50 ***	NA	Eurofins Xenco-Dallas

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** To be routinely reported when collecting data from perennial pools.
*** 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 B5.
****Flow estimate is to be only used if flow measurement is unable to be taken (e.g., when staff safety is at risk).
References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
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 A7.10 Measurement Performance Specifications for DFW Airport EAD

Field Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)*	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	SM 2550 B and TCEQ SOP V1	00020	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)*	µs/cm	water	EPA 120.1 and TCEQ SOP V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)*	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)*	s.u.	water	EPA 150.1 and TCEQ SOP V1	00400	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	NA*	NA	NA	NA	NA	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	NA*	NA	NA	NA	NA	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	NA*	NA	NA	NA	NA	Field
Flow Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=Hi gh,6=Dry	NU	water	TCEQ SOP V1	01351	NA	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)****	cfs	Water	TCEQ SOP V1	74069	NA	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	NA	NA	NA	NA	NA	Field
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	0.50 ***	NA	Eurofins Xenco-Dallas
Conventional Parameters in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
BIOCHEMICAL OXYGEN DEMAND (MG/L, 5 DAY - 20DEG C	mg/L	water	SM 5210 B	00310	2	2	NA	NA	NA	ALS Houston
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540 D	00530	5	2.5	NA	5	85-115	ALS Houston
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	SM 4500-NH3 F	00610	0.1	0.05	70-130	20	85-115	ALS Houston
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	0.5	70-130	20	90-110	ALS Houston

Conventional Parameters in Water (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
SULFATE (MG/L AS SO4)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00945	5	0.5	70-130	20	90-110	ALS Houston
Organics in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TOTAL PETROLEUM HYDROCARBON, WATER, TX005, MG/L	mg/L	water	TCEQ 1005	04720	NA	0.5	65-135	20	75-125	ALS Houston
Metals in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
ARSENIC, TOTAL (UG/L AS AS)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01002	NA	2	70-130	20	85-115	ALS Houston
BARIUM, TOTAL (UG/L AS BA)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01007	NA	4	70-130	20	85-115	ALS Houston
CADMIUM, TOTAL (UG/L AS CD)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01027	NA	2	70-130	20	85-115	ALS Houston
CHROMIUM, TOTAL (UG/L AS CR)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01034	NA	4	70-130	20	85-115	ALS Houston
COPPER, TOTAL (UG/L AS CU)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01042	NA	2	70-130	20	85-115	ALS Houston
LEAD, TOTAL (UG/L AS PB)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01051	NA	2	70-130	20	85-115	ALS Houston
NICKEL, TOTAL (UG/L AS NI)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01067	NA	2	70-130	20	85-115	ALS Houston
SILVER, TOTAL (UG/L AS AG)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01077	NA	2	70-130	20	85-115	ALS Houston
ZINC, TOTAL (UG/L AS ZN)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01092	NA	4	70-130	20	85-115	ALS Houston
SELENIUM, TOTAL (UG/L AS SE)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01147	2	2	70-130	20	85-115	ALS Houston

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** To be routinely reported when collecting data from perennial pools.
*** 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 B5.
**** Flow estimate is to be only used if flow measurement is unable to be taken (e.g., when staff safety is at risk).

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
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 A7.11 Measurement Performance Specifications for North Texas Municipal Water District

Field Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)*	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES FAHRENHEIT)	DEG F	air	SM 2550 B and TCEQ SOP V1	00021	NA*	NA	NA	NA	NA	Field
RESERVOIR ACCESS NOT POSSIBLE LEVEL TOO LOW ENTER 1 IF REPORTING	NS	other	TCEQ Drought Guidance	00051	NA*	NA	NA	NA	NA	Field
RESERVOIR STAGE (FEET ABOVE MEAN SEA LEVEL)***	FT ABOVE MSL	water	TWDB	00052	NA*	NA	NA	NA	NA	Field
RESERVOIR PERCENT FULL***	% RESERVOIR CAPACITY	water	TWDB	00053	NA*	NA	NA	NA	NA	Field
RESERVOIR STORAGE - ACRE FEET***	AC-FT	water	TWDB	00054	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)*	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)*	µs/cm	water	EPA 120.1 and TCEQ SOP V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)*	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)*	s.u.	water	EPA 150.1 and TCEQ SOP V1	00400	NA*	NA	NA	NA	NA	Field
WATER CLARITY, 1=EXCELLENT 2=GOOD 3=FAIR 4=POOR	NU	water	NA	20424	NA	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	NA*	NA	NA	NA	NA	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	NA*	NA	NA	NA	NA	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	NA*	NA	NA	NA	NA	Field
WIND INTENSITY (1=CALM,2=SLIGHT,3=MOD.,4=STRONG)	NU	other	NA	89965	NA	NA	NA	NA	NA	Field
PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=CLDY,4=RAIN,5=OTHER)	NU	other	NA	89966	NA	NA	NA	NA	NA	Field
WATER SURFACE (1=CALM,2=RIPPLE,3=WAVE,4=WHITECAP)	NU	water	NA	89968	NA	NA	NA	NA	NA	Field
WATER COLOR 1=BRWN 2=RED 3=GRN 4=BLCK 5=CLR 6=OTHER	NU	water	NA	89969	NA	NA	NA	NA	NA	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	NA	NA	NA	NA	NA	Field
Flow Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	NA	NA	NA	NA	NA	Field

Flow Parameters (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
STREAM FLOW ESTIMATE (CFS)*******	cfs	Water	TCEQ SOP V1	74069	NA	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	NA	NA	NA	NA	NA	Field
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	IDEXX Laboratories Colilert®*****	31699	1	1	NA	0.50 ****	NA	NTMWD
E. COLI, COLILERT, IDEXX, HOLDING TIME	hours	water	NA	31704	NA	NA	NA	NA	NA	NTMWD
Conventional Parameters in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
ALKALINITY, TOTAL (MG/L AS CACO3)	mg/L	water	SM 2320 B	00410	20	20	NA	20	NA	NTMWD
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540 D	00530	5	2.5	NA	20	NA	NTMWD
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.1 Rev. 2.0 (1993)	00610	0.1	0.1	70-130	20	80-120	NTMWD
NITRITE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 353.2 (alternate EPA 300.0 Rev.2.1)	00615	0.05	0.02	70-130	20	80-120	NTMWD
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 353.2 (alternate EPA 300.0 Rev.2.1)	00620	0.05	0.05	70-130	20	80-120	NTMWD
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2	00625	0.2	0.2	70-130	20	80-120	NTMWD
NITRITE PLUS NITRATE, TOTAL ONE LAB DETERMINED VALUE (MG/L AS N)	mg/L	water	EPA 353.2 (alternate EPA 300.0 Rev.2.1)	00630	0.05	0.05	70-130	20	80-120	NTMWD
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.3	00665	0.06	0.02	70-130	20	80-120	NTMWD
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.1	00665	0.06	0.02	70-130	20	80-120	NTMWD
CARBON, TOTAL ORGANIC, NPOC (TOC), MG/L	mg/L	water	SM 5310 C	00680	2	0.5	70-130	20	80-120	NTMWD
HARDNESS, TOTAL (MG/L AS CACO3)******	mg/L	water	SM 2340 C	00900	5	5	NA	20	80-120	NTMWD
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	1	70-130	20	80-120	NTMWD
SULFATE (MG/L AS SO4)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00945	5	1	70-130	20	80-120	NTMWD
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	µg/L	water	SM 10200 H	32211	3	3	70-130	20	80-120	NTMWD
PHEOPHYTIN-A UG/L SPECTROPHOTOMETRIC ACID. METH.	µg/L	water	SM 10200 H	32218	3	3	NA	NA	NA	NTMWD
RESIDUE, TOTAL FILTRABLE (DRIED AT 180C) (MG/L)	mg/L	water	SM 2540 C	70300	10	10	NA	20	80-120	NTMWD
ORTHOPHOSPHATE PHOSPHORUS, DISS, MG/L, FILTER >15MIN	mg/L	water	EPA 365.3	70507	0.04	0.02	70-130	20	80-120	NTMWD
TURBIDITY, LAB NEPHELOMETRIC TURBIDITY UNITS, NTU	NTU	water	SM 2130 B	82079	0.5	0.1	70-130	20	80-120	NTMWD

Metals in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
IRON, TOTAL (UG/L AS FE)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01045	300	200	70-130	20	80-120	NTMWD
MANGANESE, TOTAL (UG/L AS MN)	µg/L	water	EPA 200.8 Rev 5.4 (1998)	01055	50	1	70-130	20	80-120	NTMWD

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** To be routinely reported when collecting data from perennial pools.
*** As published by the Texas Water Development Board on their website https://www.waterdatafortexas.org/reservoirs/statewide
**** 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 B5.
***** *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.
****** Hardness is not used for regulatory purposes but is used to assess metals in water at inland sites (estuarine sites do not require hardness analysis).
******* Flow estimate is to be only used if flow measurement is unable to be taken (e.g., when staff safety is at risk).

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
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 A7.12 Measurement Performance Specifications for Upper Trinity Regional Water District

Field Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)*	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	SM 2550 B and TCEQ SOP V1	00020	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)*	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)*	µs/cm	water	EPA 120.1 and TCEQ SOP V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)*	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)*	s.u.	water	EPA 150.1 and TCEQ SOP V1	00400	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	NA*	NA	NA	NA	NA	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	NA*	NA	NA	NA	NA	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	NA*	NA	NA	NA	NA	Field
Flow Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	NA	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)****	cfs	Water	TCEQ SOP V1	74069	NA	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	NA	NA	NA	NA	NA	Field
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	IDEXX Laboratories Colilert®/ Colilert®-18	31699	1	1	NA	0.50 ***	NA	RS&C
Conventional Parameters in Water										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	SM 4500-NH3 H	00610	0.1	0.02	70-130	20	80-120	RS&C
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.1	00665	0.06	0.02	70-130	20	80-120	RS&C

Conventional Parameters in Water (continued)										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	µg/L	water	SM 10200 H	32211	3	3	NA	20	80-120	RS&C

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** To be routinely reported when collecting data from perennial pools.
*** 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 B5.
**** Flow estimate is to be only used if flow measurement is unable to be taken (e.g., when staff safety is at risk).

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
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 A7.13 Measurement Performance Specifications for City of Plano

Field Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)*	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	SM 2550 B and TCEQ SOP V1	00020	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)*	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C)*	µs/cm	water	EPA 120.1 and TCEQ SOP V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L)*	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS)*	s.u.	water	EPA 150.1 and TCEQ SOP V1	00400	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	NA*	NA	NA	NA	NA	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	NA*	NA	NA	NA	NA	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	NA*	NA	NA	NA	NA	Field
Flow Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	NA	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)****	cfs	Water	TCEQ SOP V1	74069	NA	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	NA	NA	NA	NA	NA	Field
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	IDEXX Laboratories Colilert®/ Colilert®-18	31699	1	1	NA	0.50 ***	NA	NTMWD

* Reporting to be consistent with SWQM guidance and based on measurement capability.

** To be routinely reported when collecting data from perennial pools.

*** 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 B5.

**** Flow estimate is to be only used if flow measurement is unable to be taken (e.g., when staff safety is at risk).

References:

United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020

U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136

American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.

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 A7.14 Measurement Performance Specifications for City of Frisco

Field Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE) *	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	NA	NA	NA	Field
TEMPERATURE, AIR (DEGREES CENTIGRADE)	DEG C	air	SM 2550 B and TCEQ SOP V1	00020	NA*	NA	NA	NA	NA	Field
TRANSPARENCY, SECCHI DISC (METERS)*	meters	water	TCEQ SOP V1	00078	NA*	NA	NA	NA	NA	Field
SPECIFIC CONDUCTANCE, FIELD (US/CM @ 25C) *	µs/cm	water	EPA 120.1 and TCEQ SOP V1	00094	NA*	NA	NA	NA	NA	Field
OXYGEN, DISSOLVED (MG/L) *	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	NA*	NA	NA	NA	NA	Field
PH (STANDARD UNITS) *	s.u.	water	EPA 150.1 and TCEQ SOP V1	00400	NA*	NA	NA	NA	NA	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	NA*	NA	NA	NA	NA	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	NA*	NA	NA	NA	NA	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	NA*	NA	NA	NA	NA	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	NA*	NA	NA	NA	NA	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	NA*	NA	NA	NA	NA	Field
Flow Parameters										
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**TCEQ AWRL**	**LOQ**	**LOQ Check Sample %Rec**	**Precision (RPD)**	**Bias %Rec. of LCS**	**Lab**
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	NA	NA	NA	NA	NA	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	NA	NA	NA	NA	NA	Field
STREAM FLOW ESTIMATE (CFS)***	cfs	Water	TCEQ SOP V1	74069	NA	NA	NA	NA	NA	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	NA	NA	NA	NA	NA	Field

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** To be routinely reported when collecting data from perennial pools.
*** Flow estimate is to be only used if flow measurement is unable to be taken (e.g., when staff safety is at risk).

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 24th Edition, 2022.
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)

Task 3: Water Quality Monitoring

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

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

Task Description: The Performing Party will conduct water quality monitoring throughout the Trinity River basin during the Contract period. Sampling activities will be coordinated and updates made at annual coordinated monitoring meetings. The Performing Party's staff will assist other agencies with water quality monitoring and related activities within the Trinity River basin as described below in the CRP Basin Support Services section. The Performing party will summarize monitoring activities and report activities quarterly.

The Performing Party will complete the following subtasks:

Monitoring Description – The focus of routine monitoring in the Trinity basin will continue to be on maximizing spatial monitoring coverage throughout the basin. This will be achieved by supporting existing sub-participants and working to gain and support additional sub-participants. The Performing Party's staff will collect samples as described below.

The Performing Party's staff will routinely monitor water quality conditions at several sites in the Trinity River basin as described in Appendix B of the FY2024-2025 Basin-wide QAPP and subsequent amendments. During the contract period, aquatic life monitoring will be conducted at a minimum of one site per fiscal year. Multiple sites will be routinely monitored on at least a quarterly basis for either the purpose of long-term monitoring or to investigate issues identified in the Integrated Report. In FY2024, at least eighteen sites will be monitored for long-term trend information and at least five sites will be monitored to investigate Integrated Report findings. For FY2025, the Performing Party will monitor at a similar level of effort. The actual number of sites, locations, and sampling frequency for FY2025 will be determined at the Coordinated Monitoring Meeting and will be reflected in Appendix B of the FY2024-2025 Basin-wide QAPP.

All monitoring will be completed in accordance with 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)*.

The Performing Party will provide assistance to sub-participants contributing data to CRP by paying for program-required quality assurance samples and additional parameters collected at the Performing Party's request on behalf of CRP as negotiated with each sub-participant. The Performing Party may also provide supplies such as sulfuric acid for field preservation of water quality samples and filter apparatuses for field filtration as required under SWQM Procedures. The Performing Party will also provide other sampling equipment deemed beneficial to the program or as necessitated by quality assurance requirements (e.g. pumps for collection and filtration of water samples, Secchi tubes for recording clarity measurements, sondes, flow meters, etc.).

Multiple stations will be monitored by participating entities as detailed in Appendix B of the FY 2024-2025 Basin-wide QAPP and subsequent amendments. Planned sub-participants include the cities of Arlington, Dallas (submitting entity codes DA and DT), Fort Worth, Frisco, Grand Prairie, Irving, and Plano, as well as Dallas/Fort Worth International Airport, Lake Livingston Project, Tarrant Regional Water District, North Texas Municipal Water District, and Upper Trinity Regional Water District. Additional sub-participants may be added throughout the course of the biennium. The Performing Party will provide varying levels of analytical cost support to these sub-participants for routine monitoring. In addition to the support provided by the Performing Party, these sub-participants contribute their own resources, in kind, which has resulted in a large number of sites being monitored in the Trinity River basin under CRP. Historically, these sub-participants have provided data for 150+ sites. The Performing Party will provide the data generated by these sub-participants to TCEQ for inclusion in SWQMIS as

detailed in the Basin-wide QAPP. It is anticipated that this level of site coverage and data generation will remain for the duration of this Contract.

CRP Basin Support Services – The Performing Party will assist other state and regional entities with water quality and biological associated studies. Previously, these activities have included assisting with Senate Bill 2 (77th Legislature) and Senate Bill 3 activities (80th Legislature), filling historical data gaps, least impacted streams studies, national lake assessments, biological work, and sonde deployments. Future activities are anticipated to fall in line with previous work and will be discussed with and pre-approved by the TCEQ Project Manager. All activities completed within this subtask will be documented in Progress Reports. All monitoring will be completed in accordance with 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 FY2024-2025 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 CMS (http://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, 2023 through August 31, 2024

A. Conduct water quality monitoring, submit monitoring activities report, summarize activities, and submit with progress report – December 15, 2023; March 15 and June 15, 2024
B. Coordinated Monitoring Meeting – between March 15 and April 30, 2024
C. Coordinated Monitoring Meeting Summary of Changes – within 2 weeks of the meeting
D. Email notification that Coordinated Monitoring Schedule updates are complete – May 31, 2024

September 1, 2024 through August 31, 2025

A. Conduct water quality monitoring, submit monitoring activities report, summarize activities, and submit with progress report – September 15 and December 15, 2024; March 15 and June 15 and August 15, 2025
B. Coordinated Monitoring Meeting – between March 15 and April 30, 2025
C. Coordinated Monitoring Meeting Summary of Changes – within 2 weeks of the meeting
D. Email notification that Coordinated Monitoring Schedule updates are complete – May 31, 2025

Sample Design Rationale FY 2024

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 Water Quality Integrated Report*, 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 TRA coordinates closely with the TCEQ and other participants to ensure a comprehensive water monitoring strategy within the watershed.

The Trinity River extends approximately 715 miles and drains about 18,000 square miles of the state before ending at Trinity Bay near Anahuac. The northern portion of the basin is dominated by the Dallas-Fort Worth Metroplex, while the southern portion provides water for the Houston Metroplex. Legacy pollutants, which are banned chemicals that are persistent in the environment, are a concern. Other results of urban life include storm water run-off that is polluted by oil and grease, pesticides, fertilizers, and animal waste. The far northern and middle reaches of the basin are characterized by agriculture. These activities can result in elevated nutrient levels from fertilizer use, bacteria from livestock waste, and soil erosion. Many areas of the basin are still experiencing high levels of oil and gas drilling activities which can have negative impacts on water quality. These impacts can include increased salinity due to run-off containing salts from clay stabilizers in fracking fluid and the co-produced brine water that often results from oil and gas recovery, increased suspended solids due to run-off containing disturbed soils from drilling sites, and the presence of drilling fluid and wastewater due to accidental spills and leakage. During the summer months, the native flow of the river in this area is reduced to a trickle, generally made up of groundwater seeps and occasional rainfall events. The larger fraction of summer flow is made up of high-quality effluent from wastewater dischargers, which allows the river to maintain a habitat far greater in flow with better water quality than historical levels. The Trinity River Authority Clean Rivers Program evaluates the entire waterbody to provide water quality data for regulatory purposes such as setting water quality standards, appropriate permit limits and evaluating the health of waterbodies.

TRA Changes from the FY 2023 Monitoring Schedule

The following changes were made for the FY 2024 Monitoring Schedule as a result of the FY 2023 Coordinated Monitoring Meeting.

- City of Arlington – no changes.
- City of Dallas (Collecting Entity Code DA) – no changes.
- DFW Airport EAD – no changes.
- City of Dallas (Collecting Entity Code DT) – no changes.
    - Other notes: These are intended as a record of intent for future monitoring schedule updates and do not apply to the current monitoring schedule. This information is included here as a matter of record.
        - Email sent on 5/11/2023 in regard to updating the lat/long and description – The City is sampling at station 20444 UPPER TRINITY RIVER 190 METERS DOWNSTREAM OF SOUTH CENTRAL EXPRESSWAY/SH 310 AND 105 METERS UPSTREAM OF RAILROAD BRIDGE. The official lat/long for this station is at 32.72831, -96.756138. The City is actually sampling about 196 meters upstream at the SH 310 bridge. A SLOC correction will be requested and updated station descriptions and lat/longs will be added in a future amendment if not approved before execution of this FY 2024-2025 QAPP.
- City of Fort Worth – no changes.
- City of Grand Prairie – no changes.
- City of Irving – no changes.
- Lake Livingston Project – no changes
    - Other notes: These are intended as a record of intent for future monitoring schedule updates and do not apply to the current monitoring schedule. This information is included here as a matter of record.
        - 24-hour DO monitoring at station 20771 was added in FY 2021 and will be conducted twice a year for 5 years (through FY 2025). It will be removed in FY 2026.
        - Email sent on 5/11/2023 in regard to updating the lat/long and description - Station 16148 needs to be adjusted. The description is COASTAL WATER AUTHORITY CANAL/LYNCHBURG CANAL 533 METERS UPSTREAM OF FM 1409 3.6KM DOWNSTREAM OF CONFLUENCE WITH TRINITY RIVER SOUTH OF LIBERTY at

29.951757, -94.838341. However, LLP says they have always sampled at the FM 1409 bridge at lat/long 29.950321, -94.843481. A SLOC correction will be requested and updated station descriptions and lat/longs will be added in a future amendment if not approved before execution of this FY 2024-2025 QAPP.
        - Email sent on 5/12/2023 in regard to updating the lat/long - Station 10913 LK LIVINGSTON 1.8 KM S AND 496 METERS E OF INTERSECTION OF FM 356 AND DAVIS RDIN MAIN CHANNEL NEAR MOUTH OF WHITE ROCK CREEK BAY TRA 6 is currently listed as 30.899995, -95.274995. Our LLP group is actually sampling slightly north in the old river channel at 30.902890, -95.275798. A SLOC correction will be requested and updated station descriptions and lat/longs will be added in a future amendment if not approved before execution of this FY 2024-2025 QAPP.
- North Texas Municipal Water District – no changes
- City of Plano – no changes.
- Tarrant Regional Water District – no changes.
    - Other notes: These are intended as a record of intent for future monitoring schedule updates and do not apply to the current monitoring schedule. This information is included here as a matter of record.
        - TRWD is looking at adding profile field parameter only sampling at stations in AUs 0818_02, 03, 05, 07, 08, 12, and 13. As of 5/12/2023, these additions have not been finalized.
        - Station 22408 CEDAR CREEK RESERVOIR SOUTHWEST CORNER AT JCC1 PUMP STATION was a new ID added in FY 2023. This station is not in the CMS list yet. I will contact LCRA and ask them to update the list so that I can add this site to the CMS.
- Upper Trinity Regional Water District – no changes.
- City of Frisco – no changes.
- Trinity River Authority
    - Aquatic Life Monitoring on Fish Creek (station 15294 Segment 0841K) has been removed. Sampling at this station will be completed in the summer of FY 2023. All attempts will be made to complete both index and critical period events before 8/31/2023.
    - Aquatic Life Monitoring on the Clear Fork Trinity River (station 22097 Segment 829) has been added for FY 2024.
    - South Fork Trinity River at FM 5 (station 17455 segment 0831A) has been removed. Sufficient sampling has been conducted for assessment.
    - Clear Fork Trinity River/Dobbs Branch at Friendship Road (station 22313 segment 0833) has been removed. Sufficient sampling has been conducted for assessment.
    - Clear Fork Trinity River at Erwin Road (station 17460 segment 0833A) has been removed. Sufficient sampling has been conducted for assessment.
    - Clear Fork Trinity River at Sarra Lane (station 17463 segment 0833A) has been removed. Sufficient sampling has been conducted for assessment.
    - Village Creek at 287 (station 10781 segment 0828A) has been removed. Sufficient sampling has bee conducted for assessment at TRWD has a station upstream so the segment will continue to be monitored.
    - Monitoring at Denton Creek stations 21295 and 21296 in segment 0826A have been changed from bimonthly monitoring to quarterly monitoring.
    - Monitoring at Grapevine Lake stations 20884, 21351, 16116, and 11036 in segment 0826 have been changed from bimonthly monitoring to quarterly monitoring.
    - Monitoring at Buffalo Creek at King Street (station 10826 segment 0819B) has been changed from bimonthly monitoring to quarterly monitoring.
    - Diel monitoring at Cedar Creek (station 22054 segment 0836B) and Grape Creek (station 22055 segment 0836C) has been added to address the impairments identified in the Integrated Report. Sampling will continue for 2 years (through FY2025). If impairments remain after this sampling, a UAA will be recommended.
    - Other notes: These are intended as a record of intent for future monitoring schedule updates and do not apply to the current monitoring schedule. This information is included here as a matter of record.
        - Reece Branch (station 22394 segment 0838A) has been added for quarterly routine monitoring to provide baseline data prior to the installation of a WWTF. Monitoring is planned to continue indefinitely.
        - Fish Creek (station 15294 Segment 0841K) has been added for 2 years (through FY 2024) of diel monitoring to address DO concerns. It will be re-evaluated or removed in FY2025.
        - Dalworth Creek (station 21557 segment 0841G) has been added for 5 years (through FY2027) for

bacteria, flow, and field parameters to address bacteria impairments. It will be re-evaluated or removed in FY2028.

- Trinity River at Malloy Bridge Road (station 10929 segment 0805) has been added for 3 years (through FY2025) for conventions, bacteria, flow, and field parameters to address nutrient concerns. It will be re-evaluated or removed in FY2026.
- 24 hour DO sampling in segment 0833A at station 17463 was added in FY2022 for two years (through FY2023) based on a TCEQ request from FY2020 (was not able to do in FY 2021 due to resources for diurnal sampling being maxed out). Sampling was conducted 5 times a year and consisted of diurnals, conventionals, flow, and field parameters. This site was added to address findings of the Integrated Report. If issues for Dissolved Oxygen remain, it is recommended that a UAA be conducted.
- 24 hour DO sampling at station 22313 in segment 0833_04 was added for two years in FY2022 (through FY2023) based on a TCEQ request. Sampling was conducted in this AU in 2015/2016 at station 17461 however the site was always dry. Recent inspection of GIS layers and Google Earth indicate that the Clear Fork has abandoned the channel where 17461 is located and moved east into a channel identified as Dobbs Branch. A new station ID 22313 was requested for "Clear Fork/Dobbs Branch". Sampling was conducted 5 times a year and consisted of diurnals, conventionals, flow, and field parameters. This site was added to address findings of the Integrated Report. If issues for Dissolved Oxygen remain, it is recommended that a UAA be conducted.
- Quarterly monitoring of conventionals, *E. coli*, flow, and field parameters has been added at station 10815 in segment 0841O to address findings of the Integrated Report. Added in FY2022 for a minimum of 5 years (through FY 2026). It will be re-evaluated or removed FY2027.
- Grapevine Lake sites 20884, 16116, 11036, 21351 were added for 2 years in FY2022 (through FY2023) for bimonthly monitoring of conventionals, *E. Coli*, and field parameters. These sites were added to address the findings of the Integrated Report. Sampling was reevaluated and will remain on the monitoring schedule at a quarterly frequency for another two years (through FY2025). They will be reevaluated in FY2026.
- Denton Creek monitoring sites 21295 and 21296 were added for 2 years in FY2022 (through FY2023) for bimonthly monitoring of conventionals, *E. coli*, flow, and field parameters to address the Integrated Report. Sampling was reevaluated and will remain on the monitoring schedule at a quarterly frequency for another two years (through FY2025). They will be reevaluated in FY2026.
- Buffalo Creek site 10826 was added for 2 years in FY2022 (through FY2023) for bimonthly monitoring of conventionals, *E. coli*, flow, and field parameters to address the Integrated Report. Site was originally at station 10825 and was moved to 10826 due to inability to reliably measure flow. Sampling was reevaluated and will remain on the monitoring schedule at a quarterly frequency for another two years (through FY2025). They will be reevaluated in FY2026.
- A site on Segment 0825 Denton Creek below Grapevine Lake (station 11034) was added by TRA for quarterly monitoring of *E. coli*, flow, and field parameters in FY 2020. This site will be sampled for at least 5 years (through FY 2024) to address *E. coli* concerns. It is anticipated to be removed from the sampling schedule in FY 2025.
- Sites upstream of the WWTPs on Red Oak Creek (Segment 0805A station 10842) and Ten Mile Creek (unclassified Segment in 0805 station 21287) were added by TRA to the monitoring schedule in FY 2020 for quarterly monitoring of *E. coli*, conventionals, flow, and field because they were not previously assessed. Sampling will take place for a minimum of 5 years (through FY 2024). Continuation of sampling after FY 2024 will be reassessed at a later date.
- Rowlett Creek station 10756 in segment 0820B will remain on the monitoring schedule until further notice. TRA is monitoring this station. It is providing data that is useful for the Watershed Characterization and future Watershed Protection Plan for Rowlett Creek.
- Waxahachie Creek station 13686 in segment 0815A was added by TRA in FY 2017 for quarterly monitoring of conventionals, *E. coli*, flow, and field parameters in response to findings in the Integrated Report. This site was originally planned to be removed in FY 2020. However, due to stakeholder input, it has been determined that this site will remain in the monitoring schedule until further input. This site is providing data that is useful for the Richland-Chambers Watershed Protection Plan that is funded by a third party.
- Stations 22234 and 16114 in Grapevine Lake (segment 0826) were added in FY 2021 to address gaps in monitoring coverage. 22234 was added at the request of TCEQ to address the carryforward pH listing in the 2020 IR. Monitoring at these sites will continue for approximately 5 years and will be reassessed for continued monitoring no later than FY 2026.
- Stations 22235 and 14041 in Ray Roberts Lake (segment 0840), 14002 and 17839 in Lake Lewisville (segment 0823), and 11004, 11010, and 11016 in Lake Ray Hubbard (segment 0820) were added in FY 2021 to address gaps in monitoring coverage. Monitoring at these sites will continue for approximately

5 years and will be reassessed for continued monitoring no later than FY 2026.

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.

City of Arlington

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	Metals Water	Conventional	Bacteria	Flow	Field	Comment
CITY OF ARLINGTON														
UNNAMED TRIBUTARY OF COTTONWOOD CREEK AT NORTH BOUND DIRECTION OF FORUM DRIVE IN ARLINGTON	10723	32.709300	-97.053300	0841F	04	TR	AR	RT	4		4	4	4	Arlington Metals Only, sample taken on west side of bridge at 32.709363, -97.053578
FISH CREEK SOUTH BRANCH 433 METERS UPSTREAM OF SH 360 SOUTH BOUND SERVICE ROAD IN NATURAL CHANNEL IMMEDIATELY UPSTREAM OF CONCRETE LINED CHANNEL	21530	32.658539	-97.066686	0841K	04	TR	AR	RT	4	4	4	4	4	Arlington Metals And Nutrients
JOHNSON CREEK AT SH 360 IN ARLINGTON	10719	32.764137	-97.062180	0841L	04	TR	AR	RT	4	4	4	4	4	Arlington Metals And Nutrients, sample taken slightly NW at 32.764260, -97.062342
KEE BRANCH AT WEST PLEASANT RIDGE ROAD IN ARLINGTON	10792	32.682500	-97.177900	0841M	04	TR	AR	RT	4		4	4	4	Arlington Metals Only
COTTONWOOD CREEK AT TIMBERLAKE DRIVE IN ARLINGTON	10722	32.724987	-97.050636	0841P	04	TR	AR	RT	4	4	4	4	4	Arlington Metals And Nutrients, sample taken about 50 meters east at 32.724998, -97.050098
RUSH CREEK IMMEDIATELY DOWNSTREAM OF WEST SUBLETT ROAD IN ARLINGTON	10791	32.649166	-97.146042	0841R	04	TR	AR	RT	4		4	4	4	Arlington Metals Only, sample taken slightly west at 32.649188, -97.146144
RUSH CREEK 46 METERS UPSTREAM OF SH 180 IN ARLINGTON	17191	32.731155	-97.169624	0841R	04	TR	AR	RT	4	4	4	4	4	Arlington Metals And Nutrients, sample taken about 94 meters downstream at 32.731932, -97.169324
VILLAGE CREEK IMMEDIATELY UPSTREAM OF IH 30 IN ARLINGTON	17189	32.759666	-97.149696	0841T	04	TR	AR	RT	4		4	4	4	Arlington Metals Only, sample taken about 88 meters downstream at 32.760434, -97.149754

City of Dallas (Collecting Entity Code DA)

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	Metals Water	Conventional	Bacteria	Field	Comment
CITY OF DALLAS (COLLECTING ENTITY CODE DA)													
LAKE RAY HUBBARD AT I 30 BRIDGE 766 METERS NORTH AND 1.26 KM EAST OF INTERSECTION OF CHAHA ROAD AND I 30 (H3)	16809	32.871223	-96.52967	0820	04	TR	DA	RT	2	12	12	12	Sample at 32.869583, -96.53535
LAKE RAY HUBBARD EAST FORK ARM AT US 66 494 M NORTH AND 1.83 KM EAST OF INTERSECTION OF US 66 AND SCENIC DRIVE WEST OF ROCKWALL (H4)	16829	32.924973	-96.48959	0820	04	TR	DA	RT	2	12	12	12	Sample at 32.92455, -96.495967
LAKE RAY HUBBARD/EAST FORK TRINITY RIVER 200 METERS DOWNSTREAM OF LAKE LAVON OUTFALL AT COLLIN CR 384 (V1)	17846	33.029854	-96.48115	0820	04	TR	DA	RT	2	12	12	12	Sample at 33.030919, -96.482144
LAKE RAY HUBBARD AT THE WEST END OF THE ROCKWALL-FORNEY DAM NEAR FORNEY (H1)	21365	32.807139	-96.5274	0820	04	TR	DA	RT	2	12	12	12	Sample at 32.808133, -96.52705
LAKE RAY HUBBARD AT MIDLAKE 1.28 KM WEST OF THE END OF PENINSULA COURT (H2)	22320	32.835367	-96.5212	0820	04	TR	DA	RT	2	12	12	12	
ROWLETT CREEK 45 METERS DOWNSTREAM OF BEN DAVIS/DAMASCUS RD RIVER KM 8.5 (H6)	10756	32.959103	-96.61109	0820B	04	TR	DA	RT	2	12	12	12	Sample at 32.959467, -96.611268
MUDDY CREEK AT LIBERTY GROVE ROAD 0.65KM UPSTREAM OF LAKE RAY HUBBARD (H5)	16828	32.929474	-96.54498	0820C	04	TR	DA	RT	2	12	12	12	Sample at 32.9294, -96.544832
ELM FORK TRINITY RIVER AT LEWISVILLE LAKE SPILLWAY 3 MI NORTHEAST OF LEWISVILLE (E1)	15252	33.069778	-96.9642	0822	04	TR	DA	RT	2	12	12	12	Sample at 33.068089, -96.964226
ELM FORK TRINITY RIVER AT INTAKE OF DALLAS WATER UTILITIES ELM FK TREATMENT PLANT 738 M DOWNSTREAM OF CONFLUENCE WITH DENTON CK IN CARROLLTON (E2)	16438	32.971931	-96.93655	0822	04	TR	DA	RT	2	12	12	12	Sample at 32.971453, -96.936573
ELM FORK TRINITY RIVER IMMEDIATELY DOWNSTREAM OF HEBRON PARKWAY SOUTHEAST OF LEWISVILLE TR255 (E4)	18358	33.012974	-96.95065	0822	04	TR	DA	RT	2	12	12	12	Sample at 33.013064, -96.950743
SKI LAKE NEAR BARCHMAN TREATMENT PLANT INTAKE 543 METERS SOUTH AND 99 METERS WEST OF INTERSECTION OF SH 482 AND I 35 EAST (E3)	17849	32.849083	-96.88651	0822D	04	TR	DA	RT	2	12	12	12	Sample at 32.848549, -96.889144
LEWISVILLE LAKE AT I 35E IN THE HICKORY CREEK ARM 681 METERS NORTH OF INTERSECTION OF I 35E AND COPPERAS BRANCH ROAD (L7)	11027	33.101917	-97.02745	0823	04	TR	DA	RT	2	12	12	12	Sample at 33.101417, -97.027067
LAKE LEWISVILLE IN STEWART CREEK ARM AT FM 423 BRIDGE 389 METERS NORTH OF INTERSECTION OF OVERLAKE DRIVE AND FM 423/MAIN STREET (L4)	16808	33.109444	-96.89153	0823	04	TR	DA	RT	2	12	12	12	Sample at 33.109556, -96.891914
LEWISVILLE LAKE AT ENTRANCE TO LITTLE ELM CREEK COVE SOUTH OF LAKEWOOD VILLAGE AND 1.9 KM WEST OF THE HIDDEN COVE PARK BUNKHOUSES (L6)	22318	33.128667	-96.96453	0823	04	TR	DA	RT	2	12	12	12	
LEWISVILLE LAKE AT OLD LAKE DALLAS 1.2 KM NORTHEAST OF THE GREEN ASH PAVILION AT WESTLAKE PARK (L5)	22319	33.118733	-96.9932	0823	04	TR	DA	RT	2	12	12	12	
CLEAR CREEK AT I 35 WEST OF US 377 APPROX 24.7 KM UPSTREAM OF LEWISVILLE LAKE SOUTH OF SANGER (L1)	16827	33.337849	-97.18131	0823C	04	TR	DA	RT	2	12	12	12	Sample at Cowling Road 33.336304, -97.179149
DOE BRANCH AT US 380 NEAR PROSPER (L3)	20291	33.2194	-96.89123	0823D	04	TR	DA	RT	2	12	12	12	Sample at 33.219465, -96.891176

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	Metals Water	Conventional	Bacteria	Field	Comment
ELM FORK TRINITY RIVER IMMEDIATELY DOWNSTREAM OF FM 2071 SOUTH OF GAINESVILLE (R1)	11031	33.582363	-97.12835	0824	04	TR	DA	RT	2	12	12	12	Sample at 33.582321, -97.130565
DENTON CREEK 41 METERS UPSTREAM OF DENTON TAP ROAD 2 MI NORTH OF COPPELL (E5)	14244	32.98114	-96.99289	0825	04	TR	DA	RT	2	12	12	12	Sample at 32.981069, -96.993685
GRAPEVINE LAKE AT TWIN COVES PARK 270 METERS SOUTH AND 30 METERS EAST OF THE SOUTHERNMOST BOAT RAMP AT THE END OF TWIN COVES PARK ROAD NEAR GRAPEVINE (G3)	21354	33.00025	-97.10439	0826	04	TR	DA	RT	2	12	12	12	Sample at 32.998945, -97.104822
GRAPEVINE LAKE NEAR THE DAM 427 METERS SOUTH AND 182 METERS WEST OF THE OUTLET WORKS (G4)	22316	32.968867	-97.05915	0826	04	TR	DA	RT	2	12	12	12	
GRAPEVINE LAKE AT MIDLAKE 860 METERS SOUTHWEST OF THE END OF MURRELL PARK ROAD (G5)	22317	32.993217	-97.1089	0826	04	TR	DA	RT	2	12	12	12	
DENTON CREEK AT FM 156 2.4 MILES NORTH OF JUSTIN (G1)	14483	33.119038	-97.29109	0826A	04	TR	DA	RT	2	12	12	12	Sample at 33.119016, -97.291285
DENTON CREEK AT FM 407 1.2 MILES EAST OF JUSTIN (G2)	14484	33.089958	-97.27535	0826A	04	TR	DA	RT	2	12	12	12	Sample at 33.089959, -97.275533
ELM FORK TRINITY RIVER 336 METERS DOWNSTREAM OF RAY ROBERTS DAM 5.7 MI SW OF PILOT POINT 3.3 MI UPSTREAM FROM BRAY BRANCH (L2)	13619	33.350277	-97.04694	0839	04	TR	DA	RT	2	12	12	12	Sample at 33.352724, -97.048605
RAY ROBERTS LAKE USGS SITE CC 1.99 KM NORTH AND 737 METERS WEST OF INTERSECTION OF QUAIL RUN CIRCLE AND ISLE DU BOIS STATE PARK ROAD (R5)	14042	33.398056	-97.03361	0840	04	TR	DA	RT	2	12	12	12	Sample at 33.39855, -97.033633
RAY ROBERTS LAKE BUCK CREEK COVE AT US377 BRIDGE 1.06 KM N AND 428 M E OF INTERSECTION OF US 377 AND EMBERSON CHAPEL RD SW OF SHERMAN (R3)	16822	33.447445	-96.92303	0840	04	TR	DA	RT	2	12	12	12	Sample at 33.446381, -96.923985
RAY ROBERTS LAKE IN RANGE CREEK COVE AT US 377 BRIDGE 600 M SOUTH AND 57 M WEST OF INTERSECTION OF PATTON RD AND US 377 SW OF SHERMAN (R2)	16823	33.504833	-96.90817	0840	04	TR	DA	RT	2	12	12	12	Sample at 33.504753, -96.907859
RAY ROBERTS LAKE NEAR THE DAM 600 METERS NORTH AND 395 METERS WEST OF THE OUTLET WORKS (R6)	22314	33.360567	-97.0541	0840	04	TR	DA	RT	2	12	12	12	
RAY ROBERTS LAKE AT ELM FORK ARM 1.4 KM SOUTH AND 0.82 KM EAST OF THE INTERSECTION OF FM 231 AND FM 3002/EAST LONE OAK ROAD (R4)	22315	33.425683	-97.11403	0840	04	TR	DA	RT	2	12	12	12	

DFW Airport EAD

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	Metals Water	Organics Water	Conventional	Bacteria	Flow	Field	Comment
DFW AIRPORT EAD															
GRAPEVINE CREEK APPROX 225 METERS UPSTREAM OF N ROYAL LANE AND 25 METERS UPSTREAM OF RAILROAD TRACKS IN IRVING	21632	32.93792	-97.02211	0822B	04	TR	DF	RT	4	4	4	4	4	4	
HACKBERRY CREEK AT CABELL ROAD IN IRVING	17172	32.9021	-96.99236	0822C	04	TR	DF	RT	4	4	4	4	4	4	
SOUTH FORK HACKBERRY CREEK AT VALLEY VIEW LANE IN IRVING	21634	32.88592	-96.99937	0822E	04	TR	DF	RT	4	4	4	4	4	4	
COTTONWOOD BRANCH AT KELLER GRAPEVINE ROAD IN IRVING	22089	32.94178	-97.04217	0825A	04	TR	DF	RT	4	4	4	4	4	4	
BEAR CREEK AT COUNTY LINE ROAD 487 M SOUTH OF SH 183 IN IRVING	18315	32.83262	-97.03036	0841B	04	TR	DF	RT	4	4	4	4	4	4	
BIG BEAR CREEK IMMEDIATELY UPSTREAM OF EULESS-GRAPEVINE ROAD IN GRAPEVINE EAST OF HWY 360	17089	32.89533	-97.0825	0841D	04	TR	DF	RT	4	4	4	4	4	4	

City of Dallas (Collecting Entity Code DT)

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	Bacteria	Flow	Field	Comment
CITY OF DALLAS (COLLECTING ENTITY CODE DT)												
UPPER TRINITY RIVER 190 METERS DOWNSTREAM OF SOUTH CENTRAL EXPRESSWAY/SH 310 AND 105 METERS UPSTREAM OF RAILROAD BRIDGE	20444	32.72831	-96.75614	0805	04	TR	DT	RT	4	4	4	Sample at 32.728022, -96.758282
UPPER TRINITY RIVER AT SYLVAN AVENUE IN DALLAS	20933	32.78989	-96.83518	0805	04	TR	DT	RT	4	4	4	
UPPER TRINITY RIVER AT SANTA FE AVENUE IN DALLAS UNDER DART RAIL BRIDGE	20934	32.75301	-96.79164	0805	04	TR	DT	RT	4	4	4	

City of Fort Worth

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	Bacteria	Flow	Field	Comment
CITY OF FORT WORTH												
WEST FORK TRINITY RIVER 260 METERS DOWNSTREAM OF HANDLEY EDERVILLE ROAD 0.55KM UPSTREAM OF IH 820 IN FORT WORTH	16120	32.78137	-97.21845	0806	04	TR	FW	RT	4		12	
WEST FORK TRINITY RIVER AT BOAT RAMP IMMEDIATELY UPSTREAM OF JACKSBORO HIGHWAY/SH 199 IN FORT WORTH	21558	32.765	-97.35134	0806	04	TR	FW	RT	4		12	
MARINE CREEK AT NE 23rd STREET CONCRETE APRON APPROX 25 METERS WEST OF THE MULE ALLEY AND NE 23RD STREET INTERSECTION	21801	32.78588	-97.34539	0806D	04	TR	FW	RT	4	12	12	
MARINE CREEK UPSTREAM OF NW 26TH STREET IN RODEO PARK IN FORT WORTH	22326	32.79186	-97.35063	0806D	04	TR	FW	RT	4		12	
SYCAMORE CREEK AT WESTERN END OF PAVEMENT OF SCOTT AVENUE 179 M UPSTREAM OF IH 30 IN EAST FORT WORTH	17369	32.74755	-97.29472	0806E	04	TR	FW	RT	4	12	12	
CLEAR FORK TRINITY RIVER MID CHANNEL 85 M UPSTREAM OF SPILLWAY AND IMMEDIATELY UPSTREAM OF WEST ROSEDALE STREET IN FORT WORTH	18456	32.73224	-97.35863	0829	04	TR	FW	RT	4	12	12	
MARYS CREEK AT WINSCOTT ROAD IN FORT WORTH	22236	32.69511	-97.44731	0829	04	TR	FW	RT	4	12	12	

City of Frisco

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	Flow	Field	Comment
CITY OF FRISCO											
WEST ROWLETT CREEK AT HIGHWAY 121 WESTBOUND ACCESS ROAD IN THE CITY OF FRISCO	22283	33.12471	-96.73633	0820B	04	TR	FR	RT	4	4	
ROWLETT CREEK 20 METERS DOWNSTREAM OF CUSTER ROAD/FM 2478 IN THE CITY OF FRISCO	22284	33.1771	-96.73239	0820B	04	TR	FR	RT	4	4	
PARVIN BRANCH 65 METERS UPSTREAM OF PRESTON ROAD/SH 289 IN THE CITY OF FRISCO	22280	33.21441	-96.80182	0823	04	TR	FR	RT	4	4	
PANTHER CREEK AT FM 423 IN THE CITY OF FRISCO	22281	33.20646	-96.88027	0823	04	TR	FR	RT	4	4	
PANTHER CREEK 62 METERS UPSTREAM OF COBB HILL DRIVE AND THE BURLINGTON NORTHERN SANTA FE RAILROAD BRIDGE	22282	33.18189	-96.82063	0823	04	TR	FR	RT	4	4	
COTTONWOOD BRANCH 410 METERS UPSTREAM OF FM 423 AND 117 METERS SOUTH OF CRESTRIDGE DRIVE DEAD END IN THE CITY OF FRISCO	22285	33.16615	-96.8868	0823	04	TR	FR	RT	4	4	
STEWART CREEK AT GRAND PARK 713 METERS DOWNSTREAM OF DALLAS NORTH TOLLWAY IN THE CITY OF FRISCO	22278	33.13885	-96.84371	0823B	04	TR	FR	RT	4	4	
STEWART CREEK AT THE SOUTH END OF TEEL PARKWAY 1.68 KM DOWNSTREAM OF LEBANON ROAD IN THE CITY OF FRISCO	22279	33.11527	-96.87334	0823B	04	TR	FR	RT	4	4	

City of Grand Prairie

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	Metals Water	Conventional	Bacteria	Flow	Field	Comment
CITY OF GRAND PRAIRIE														
LOWER WEST FORK TRINITY RIVER AT ROY ORR BOULEVARD IN GRAND PRAIRIE (6)	17669	32.7883	-97.03156	0841	04	TR	GP	RT	1	4	12		12	
COTTONWOOD CREEK IMMEDIATELY UPSTREAM OF SOUTHWEST 3RD STREET IN GRAND PRAIRIE (11)	17674	32.7261	-97.00726	0841F	04	TR	GP	RT	1	4	12		12	Added back at request of TCEQ TMDL Team
SOUTH FORK COTTONWOOD CREEK AT ROBINSON ROAD IN GRAND PRAIRIE (9)	17676	32.72026	-97.01962	0841F	04	TR	GP	RT	1	4	12	12	12	
FISH CREEK SOUTH BRANCH AT GREAT SOUTHWEST PARKWAY/LAKERIDGE PARKWAY IN GRAND PRAIRIE (28)	15294	32.65924	-97.04197	0841K	04	TR	GP	RT	1	4	12	12	12	
FISH CREEK AT BELTLINE ROAD/FM1382 APPROXIMATELY 205 METERS SOUTH OF THE INTERSECTION OF SE 14TH STREET (15)	17679	32.6923	-96.9853	0841K	04	TR	GP	RT	1	4	12		12	Added back at request of TCEQ TMDL Team
KIRBY CREEK AT CORN VALLEY ROAD IN GRAND PRAIRIE (12)	17675	32.69069	-97.00308	0841N	04	TR	GP	RT	1	4	12	12	12	
CROCKETT BRANCH COTTONWOOD CREEK 179 METERS DOWNSTREAM OF EAST GRAND PRAIRIE ROAD IN GRAND PRAIRIE (22)	17683	32.74097	-97.00064	0841V	04	TR	GP	RT	1	4	12	12	12	

City of Irving

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	Metals Water	Conventional	Bacteria	Flow	Field	Comment
CITY OF IRVING														
COTTONWOOD BRANCH AT NORTH STORY ROAD IN IRVING	17166	32.86483	-96.97732	0822A	04	TR	IR	RT			6	6	6	Irving Bacteria
COTTONWOOD BRANCH 71 METERS UPSTREAM OF NORTH MACARTHUR BOULEVARD IN IRVING	17167	32.87283	-96.95992	0822A	04	TR	IR	RT	2	6	6		6	Irving Routine
GRAPEVINE CREEK AT NORTH MACARTHUR BLVD. 3.5 KM UPSTREAM OF THE CONFLUENCE WITH THE ELM FORK TRINITY RIVER	20311	32.95028	-96.95812	0822B	04	TR	IR	RT			6	6	6	Irving Bacteria
HACKBERRY CREEK AT COLWELL BOULEVARD IN IRVING	17170	32.8844	-96.94687	0822C	04	TR	IR	RT	2	6	6	6	6	Irving Routine
BEAR CREEK 37 METERS DOWNSTREAM OF COUNTY LINE ROAD SOUTH OF SR 183 IN IRVING	10869	32.83254	-97.03	0841B	04	TR	IR	RT	2	6	6	6	6	Irving Routine
DELAWARE CREEK IMMEDIATELY DOWNSTREAM OF EAST OAKDALE ROAD IN IRVING	17178	32.79378	-96.93617	0841H	04	TR	IR	RT	2	6	6	6	6	Irving Routine
DRY BRANCH IMMEDIATELY UPSTREAM OF SOUTH BELTLINE ROAD IN IRVING	17173	32.80337	-96.99468	0841I	04	TR	IR	RT			6	6	6	Irving Bacteria
ESTELLE CREEK 79 METERS UPSTREAM OF WEST PIONEER DRIVE IN IRVING	17174	32.83228	-97.02061	0841J	04	TR	IR	RT			6		6	Irving Bacteria
WEST IRVING BRANCH AT WEST VILBIG STREET IN IRVING	17179	32.79752	-96.95497	0841U	04	TR	IR	RT			6	6	6	Irving Bacteria

City of Plano

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	Bacteria	Flow	Field	Comment
CITY OF PLANO												
ROWLETT CREEK IMMEDIATELY DOWNSTREAM OF 14TH ST/SH 544 RIVER KM 19.2	10764	33.010551	-96.631813	0820B	04	TR	PN	RT	4	4	4	
ROWLETT CREEK 100 METERS DOWNSTREAM OF US 75 IN ALLEN/PLANO	20378	33.075167	-96.685529	0820B	04	TR	PN	RT	4	4	4	
SPRING CREEK AT CUSTER ROAD IN PLANO VETERANS MEMORIAL PARK WITHIN THE CITY OF PLANO	22250	33.05654	-96.73352	0820B	04	TR	PN	RT	4	4	4	
SPRING CREEK 190 METERS DOWNSTREAM OF WEST PLANO PARKWAY IN THE CITY OF PLANO	22254	33.007507	-96.711939	0820B	04	TR	PN	RT	4	4	4	
INDIAN CREEK 315 METERS DOWNSTREAM OF KINGS MANOR LANE NEAR THE END OF SHADY BROOK TRAIL	22258	33.06851	-96.855842	0822	04	TR	PN	RT	4	4	4	
WHITE ROCK CREEK AT WEST PLANO PARKWAY IN THE CITY OF PLANO	22256	33.016278	-96.814139	0827A	04	TR	PN	RT	4	4	4	
WHITE ROCK CREEK 90 METERS DOWNSTREAM OF SAM RAYBURN TOLLWAY/SH 121	22257	33.10407	-96.7852	0827A	04	TR	PN	RT	4	4	4	

Lake Livingston Project

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	24HR	Metals Water	Conventional	Bacteria	Flow	Field	Comment
LAKE LIVINGSTON PROJECT - IN BASIN															
OLD RIVER AT FM 1409 SOUTHWEST OF WINFREE	18360	29.87471	-94.82862	0801B	12	TR	LL	RT			2			2	Trinity Bay
COASTAL WATER AUTHORITY CANAL/LYNCHBURG CANAL 533 METERS UPSTREAM OF FM 1409 3.6KM DOWNSTREAM OF CONFLUENCE WITH TRINITY RIVER SOUTH OF LIBERTY	16148	29.95176	-94.83834	0801D	12	TR	LL	RT			2	2	2	2	Lake Livingston Routine, Location Correction 29.950321 -94.843481
TRINITY RIVER AT US 59 SOUTH OF GOODRICH TRA #30	10897	30.571	-94.94958	0802	10	TR	LL	RT		2	4	4	4	4	Lake Livingston Routine
TRINITY RIVER AT FM 3278 775 METERS DOWNSTREAM OF LAKE LIVINGSTON AND 8MI EAST OF COLDSPRING	16998	30.62558	-95.01078	0802	10	TR	LL	RT			12	12	12	12	Trinity Bay
LONG KING CREEK 80 METERS UPSTREAM OF FM 1988 WEST OF GOODRICH TRA #36	10689	30.60449	-94.95791	0802B	10	TR	LL	RT			2	2	2	2	Lake Livingston Routine
MENARD CREEK AT SH 146 SOUTHEAST OF LIVINGSTON TRA #37	10688	30.48133	-94.77956	0802D	12	TR	LL	RT			2	2	2	2	Lake Livingston Routine
BIG CREEK AT US 59 NORTH 1.5 MI NE OF SHEPHERD 11.6 MI UPSTREAM FROM MOUTH	13685	30.5167	-94.98482	0802E	10	TR	LL	RT			2	2	2	2	Lake Livingston Routine
LAKE LIVINGSTON IN MAIN POOL NEAR DAM AT TRA BOUY #2 4.25 KM WEST OF INTERSECTION OF FM 1988 AND FM 3128	10899	30.65	-95.04166	0803	10	TR	LL	RT		2	4	4		4	Lake Livingston Routine
LK LIVINGSTON 1.8 KM S AND 496 METERS E OF INTERSECTION OF FM 356 AND DAVIS RDIN MAIN CHANNEL NEAR MOUTH OF WHITE ROCK CREEK BAY TRA 6	10913	30.9	-95.275	0803	10	TR	LL	RT		2	4	4		4	Lake Livingston Routine, Location Correction 30.902890 -95.275798
LAKE LIVINGSTON AT SH 19 SOUTH OF TRINITY USGS SITE JC	10914	30.85972	-95.39833	0803	12	TR	LL	RT		2	12	12		12	Lake Livingston Routine
LAKE LIVINGSTON HEADWATERS AT SH 21 NORTHEAST OF MID WAY TRA 97	10917	31.07758	-95.69966	0803	10	TR	LL	RT		2	12	12		12	Lake Livingston Routine
LAKE LIVINGSTON AT US 190 IN KICKAPOO CREEK BAY CHANNEL EAST OF ONALASKA TRA #12	21562	30.81407	-95.08257	0803	10	TR	LL	RT		2	4	4		4	Lake Livingston Routine
LAKE LIVINGSTON MAIN BODY AT US 190 WEST OF ONALASKA	21563	30.79995	-95.15614	0803	10	TR	LL	RT		2	4	4		4	Lake Livingston Routine
HARMON CREEK 509 METERS UPSTREAM FROM INTERSECTION WITH OTTER RD EAST OF FM 980 AND 7.6 MILES NORTHEAST OF HUNTSVILLE	10698	30.8201	-95.48647	0803A	12	TR	LL	RT			2	2	2	2	Lake Livingston Routine
WHITE ROCK CREEK AT SH 94 NORTHEAST OF TRINITY TRA #21	10696	30.9682	-95.33308	0803B	10	TR	LL	RT			2	2		2	Lake Livingston Routine
NELSON CREEK AT FM 3478 NEAR MOUNT OLIVE TRA #20	10700	30.89458	-95.51449	0803E	12	TR	LL	RT			2	2	2	2	Lake Livingston Routine
BEDIAS CREEK IMMEDIATELY DOWNSTREAM OF US 75 SOUTHEAST OF MADISONVILLE	10703	30.88462	-95.77776	0803F	09	TR	LL	RT		2	2	2	2	2	Lake Livingston Routine
TRINITY RIVER 304 METERS UPSTREAM OF SH 7 11.9 MI WEST OF CROCKETT	13690	31.33833	-95.65611	0804	10	TR	LL	RT		2	12	12	12	12	Lake Livingston Routine

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	24HR	Metals Water	Conventional	Bacteria	Flow	Field	Comment
UPPER KEECHI CREEK IMMEDIATELY UPSTREAM OF FM 542 IN LEON COUNTY	20771	31.40566	-95.7646	0804H	09	TR	LL	RT	2				2		Diel - Added in FY2021 and will be conducted twice a year for 5 years (through FY2025). Reevaluate for FY2026.
LAKE LIVINGSTON PROJECT - OUT OF BASIN															
CEDAR BAYOU ABOVE TIDAL 20 M DOWNSTREAM OF US 90 NORTHEAST OF CROSBY	11120	29.97228	-94.98544	0902	12	TR	LL	RT			2		2	2	Trinity Bay, Out of Basin
DOUBLE BAYOU WEST FORK AT FM 2936 SOUTHEAST OF ANAHUAC	18361	29.73061	-94.66029	2422B	12	TR	LL	RT			2			2	Trinity Bay, Out of Basin
DOUBLE BAYOU EAST FORK AT FM 562 SOUTHEAST OF ANAHUAC	10658	29.68316	-94.6224	2422D	12	TR	LL	RT			2			2	Trinity Bay, Out of Basin

North Texas Municipal Water District

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	Metals Water	Conventional	Bacteria	Flow	Field	Comment
NORTH TEXAS MUNICIPAL WATER DISTRICT														
LAKE LAVON EAST FORK ARM 273 METERS NORTH AND 1.04 KM WEST OF INTERSECTION OF SUNNY LANE AND LAVON LAKE ROAD (RAW 3)	11021	33.05556	-96.52167	0821	04	TR	NM	RT	12	12	12		12	NTMWD Site 17
LAKE LAVON PILOT GROVE ARM 207 METERS NORTH AND 1.82 KM WEST OF INTERSECTION OF CR 761 AND CR 546 (6)	11022	33.08333	-96.47083	0821	04	TR	NM	RT	4	12	12		12	NTMWD Site 6
LAVON LAKE USGS SITE AC 1.01 KM NORTH AND 927 METERS EAST OF INTERSECTION OF SH 78 AND SKYVIEW DRIVE NEAR DAM (7)	15685	33.03417	-96.48028	0821	04	TR	NM	RT	12	12	12		12	NTMWD Site 7
LAVON LAKE USGS SITE EC 1.69 KM EAST OF INTERSECTION OF BROCKDALE PARK AND COLLIN CR 967 (9)	15686	33.08	-96.53222	0821	04	TR	NM	RT	4	12	12		12	NTMWD Site 9
LAVON LAKE USGS SITE BC 194 METERS NORTH AND 719 METERS WEST OF INTERSECTION OF COLLIN CR 1047 AND COLLIN CR 1055 (2)	15687	33.115	-96.45889	0821	04	TR	NM	RT	4	12	12		12	NTMWD Site 2
LAKE LAVON WEST OF EASTFORK PARK AND EAST OF INTAKE #3 467 METERS N AND 456 METERS W OF INTERSECTION OF SKYVIEW DR AND PRIVATE RD 5313 (8)	17584	33.04125	-96.50565	0821	04	TR	NM	RT	12	12	12		12	NTMWD Site 8
LAKE LAVON AT HWY 380 AT THE CONFLUENCE OF SISTER GROVE CREEK ARM AND PILOT GROVE CREEK ARM APPROX 250 METERS EAST OF THE INTERSECTION OF FM 559 AND HWY 380	21718	33.16228	-96.42939	0821	04	TR	NM	RT	4	12	12		12	NTMWD Site 1
LAKE LAVON EAST FORK ARM 130 METERS NORTH OF EAST LUCAS ROAD AND 1.6 KILOMETERS WEST AND 340 METERS SOUTH OF THE INTERSECTION OF EAST LUCAS ROAD AND OF FM 546	21719	33.09858	-96.53228	0821	04	TR	NM	RT	4	12	12		12	NTMWD Site 10
LAKE LAVON EAST FORK ARM 1.37 KILOMETERS NORTH AND 2.33 KILOMETERS WEST OF THE INTERSECTION OF EAST LUCAS ROAD AND FM 546	21720	33.11404	-96.54011	0821	04	TR	NM	RT	4	12	12		12	NTMWD Site 11
LAKE LAVON EAST FORK ARM 1.20 KILOMETERS NORTH AND 1.72 KILOMETERS WEST OF THE INTERSECTION OF EAST LUCAS ROAD AND FM 546	21721	33.11258	-96.53331	0821	04	TR	NM	RT	4	12	12		12	NTMWD Site 12
LAKE LAVON EAST FORK ARM 970 METERS NORTH AND 2.10 KILOMETERS WEST OF THE INTERSECTION OF EAST LUCAS ROAD AND FM 546	21722	33.11044	-96.53756	0821	04	TR	NM	RT			12		12	NTMWD Site 13
LAKE LAVON EAST FORK ARM 430 METERS NORTH AND 1.81 KILOMETERS WEST OF THE INTERSECTION OF EAST LUCAS ROAD AND FM 546	21723	33.10556	-96.53428	0821	04	TR	NM	RT			12		12	NTMWD Site 14
LAKE LAVON AT THE MOUTH OF SISTER GROVE CREEK ARM 735 METERS NORTH AND 860 METERS WEST OF THE INTERSECTION OF HWY 380 AND FM 559	21724	33.16958	-96.44108	0821	04	TR	NM	RT	4	12	12		12	NTMWD Site 15
LAKE LAVON AT THE MOUTH OF PILOT GROVE CREEK ARM 320 METERS NORTH AND 890 METERS EAST OF THE INTERSECTION OF HWY 380 AND FM 559	21725	33.16597	-96.42242	0821	04	TR	NM	RT	4	12	12		12	NTMWD Site 16
PILOT GROVE CREEK AT FM 2756 UPSTREAM OF LAKE LAVON	21717	33.21432	-96.40241	0821A	04	TR	NM	RT	4	12	12	12	12	NTMWD Site 23
SISTER GROVE CREEK DOWNSTREAM FM 1377/MONTE CARLO BLVD 1.6 K EAST OF INTERSECTION OF 6TH STREET AND FM 1377 NEAR PRINCETON TX	21396	33.19364	-96.47616	0821B	04	TR	NM	RT	4	12	12	12	12	NTMWD Site 20
LAKE LAVON AT THE MOUTH OF ELM CREEK ARM 1.47 METERS NORTH OF INTERSECTION OF CR 547 AND CR 546	TR421	33.09414	-96.43832	0821	04	TR	NM	RT	4	12	12		12	NTMWD Elm Creek

Tarrant Regional Water District

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	24HR	Metals Water	Conventional	Bacteria	Flow	Field	Comment
TARRANT REGIONAL WATER DISTRICT - IN BASIN															
TEHUACANA CREEK 20 METERS DOWNSTREAM OF SH 75 SOUTHEAST OF STREETMAN	10705	31.84851	-96.28997	0804F	09	TR	TD	RT		2	2	2	2	2	TRWD Tribs
WEST FORK TRINITY RIVER 54 METERS DOWNSTREAM OF BEACH STREET IN FORT WORTH	10938	32.75225	-97.28886	0806	04	TR	TD	RT		4	4	4	4	4	4th Street/Beach Street Dam
WEST FORK TRINITY RIVER IMMEDIATELY DOWNSTREAM OF 4TH STREET EAST OF FORT WORTH	17368	32.76291	-97.31175	0806	04	TR	TD	RT		4	4	4		4	4th Street/Beach Street Dam
LAKE WORTH 546 METERS SOUTH AND 319 METERS EAST OF INTERSECTION OF QUEBEC STREET AND CAHOBA DRIVE MID LAKE NEAR DAM	10942	32.79256	-97.42033	0807	04	TR	TD	BS	2						TRWD Diel
LAKE WORTH 546 METERS SOUTH AND 319 METERS EAST OF INTERSECTION OF QUEBEC STREET AND CAHOBA DRIVE MID LAKE NEAR DAM	10942	32.79256	-97.42033	0807	04	TR	TD	RT		5	5	4		5	TRWD Routine Intake - Conventionals, Metals in Water, and Bacteria also collected below surface depth (0.3m) at this site.
LAKE WORTH MID CHANNEL 35 M DOWNSTREAM OF MOUTH OF WEST FORK OF THE TRINITY RIVER	15163	32.84889	-97.47565	0807	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
LAKE WORTH AT MOUTH OF SILVER CREEK 957 METERS SOUTH AND 1.08 KM WEST OF INTERSECTION OF SILVER CREEK ROAD AND HERON DRIVE	15166	32.8008	-97.4808	0807	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
LAKE WORTH MID CHANNEL SOUTH OF SH 199 472 METERS SOUTH AND 298 METERS WEST OF INTERSECTION OF WATERCRESS DRIVE AND SH 199	15167	32.81814	-97.45248	0807	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals, and Bacteria also collected below surface depth (0.3m) at this site.
EAGLE MOUNTAIN RESERVOIR 250 METERS NORTH OF EAST EDGE OF DAM	10944	32.87639	-97.46083	0809	04	TR	TD	RT		5	5	4		5	TRWD Routine Intake - Conventionals, Metals in Water, and Bacteria also collected below surface depth (0.3m) at this site.
EAGLE MOUNTAIN RESERVOIR 250 METERS NORTH OF EAST EDGE OF DAM	10944	32.87639	-97.46083	0809	04	TR	TD	BS	2						TRWD Diel
EAGLE MOUNTAIN RESERVOIR 1.5 KM W AND 308 METERS S OF INTERSECTION BETWEEN VILLAGE RD AND EAGLE MOUNTAIN PLANT ROAD NEAR TEXAS ELECTRIC	10952	32.905	-97.49	0809	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	24HR	Metals Water	Conventional	Bacteria	Flow	Field	Comment
EAGLE MOUNTAIN RESERVOIR 645 METERS WEST AND 485 METERS SOUTH OF INTERSECTION OF OAKWOOD LANE AND PEDEN ROAD NEAR COLE SUBDIVISION	10956	32.93722	-97.50889	0809	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
EAGLE MOUNTAIN RESERVOIR 112 METERS NORTH AND 818 METERS EAST OF INTERSECTION OF MILLER RD AND GANTT ROAD NEAR INDIAN CREEK COVE	10960	32.96528	-97.50806	0809	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
EAGLE MOUNTAIN RESERVOIR 187 METERS NORTH AND 788 METERS EAST OF INTERSECTION OF BRIAR ROAD AND LIBERTY SCHOOL ROAD NEAR NEWARK BEACH	10964	32.99445	-97.51334	0809	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
WALNUT CREEK AT FM 1542	10853	32.94561	-97.58297	0809A	04	TR	TD	RT			12	12	12	12	TRWD Tribs
ASH CREEK 56 METERS DOWNSTREAM OF SH 199 NORTHBOUND SERVICE ROAD	10854	32.88713	-97.53799	0809B	04	TR	TD	RT			12	12	12	12	TRWD Tribs
DOSIER CREEK AT FM 1220	10855	32.89291	-97.43554	0809C	04	TR	TD	RT			6	6		12	TRWD Tribs-Field for 6 events will consist of flow severity only
DERRETT CREEK AT CENTRAL AVENUE IN NEWARK EAST OF EAGLE MOUNTAIN LAKE APPROX 1.2KM UPSTREAM OF EAGLE MOUNTAIN LAKE	10858	33.00392	-97.491	0809D	04	TR	TD	RT			6	6		12	TRWD Tribs-Field for 6 events will consist of flow severity only
WEST FORK TRINITY RIVER AT WISE CR 4757/VAN METER BRIDGE	10967	33.03475	-97.53416	0810	04	TR	TD	RT				4		4	West Fork *E. Coli*
WEST FORK TRINITY RIVER 30 METERS DOWNSTREAM OF FM 730 NE OF BOYD	10969	33.08575	-97.55835	0810	04	TR	TD	RT			12	12	12	12	TRWD Tribs. Site also monitored 4x/year for bacteria,flow, and field for WF E.coli project
WEST FORK TRINITY RIVER 281 METERS DOWNSTREAM OF CONFLUENCE WITH MARTIN BRANCH 2.2 MI SE OF PARADISE	14246	33.15155	-97.65553	0810	04	TR	TD	RT				4		4	West Fork *E. Coli*
WEST FORT TRINITY RIVER IMMEDIATELY DOWNSTREAM OF US 380 1.8 MI SW OF BRIDGEPORT	14904	33.20196	-97.80278	0810	04	TR	TD	RT				4		4	West Fork *E. Coli*
WEST FORK TRINITY RIVER AT BOBO BRIDGE ON WISE CR 4668 SOUTH OF BOYD	17844	33.05185	-97.55785	0810	04	TR	TD	RT				4		4	West Fork *E. Coli*
WEST FORK TRINITY RIVER BELOW BRIDGEPORT RESERVOIR AT SH 114 APPROX 333 METERS SOUTH AND 647 METERS EAST OF THE INTERSECTION OF SH 114 AND INDUSTRIAL BOULEVARD IN WISE COUNTY	20840	33.19179	-97.74343	0810	04	TR	TD	RT				4		4	West Fork *E. Coli*

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	24HR	Metals Water	Conventional	Bacteria	Flow	Field	Comment
BIG SANDY CREEK 42 METERS DOWNSTREAM OF US 380 4.0 MI EAST OF BRIDGEPORT	15688	33.23167	-97.69467	0810A	04	TR	TD	RT				4	4	4	West Fork *E. Coli*
GARRETT/RUSH CREEK AT SH 114 NORTH OF EAGLE MOUNTAIN RESERVOIR NW OF BOYD	16767	33.10528	-97.65517	0810B	04	TR	TD	RT				4		4	West Fork *E. Coli*
MARTIN BRANCH CENTER CREEK AT FM 51 EAST OF PARADISE	17848	33.14962	-97.63611	0810C	04	TR	TD	RT				4		4	West Fork *E. Coli*
SALT CREEK AT SH 114 NORTH OF EAGLE MOUNTAIN RESERVOIR NW OF BOYD	16766	33.09842	-97.65	0810D	04	TR	TD	RT				4		4	West Fork *E. Coli*
LAKE BRIDGEPORT 178 METERS WEST AND 187 METERS SOUTH OF NORTH EDGE OF DAM	10970	33.22167	-97.834	0811	04	TR	TD	BS	2						TRWD Diel
LAKE BRIDGEPORT 178 METERS WEST AND 187 METERS SOUTH OF NORTH EDGE OF DAM	10970	33.22167	-97.834	0811	04	TR	TD	RT		5	5	4		5	TRWD Routine Intake - Conventionals, Metals in Water, and Bacteria also collected below surface depth (0.3m) at this site.
LAKE BRIDGEPORT AT NORTH END OF MAIN BODY OF RESERVOIR 10 METERS NORTH AND 1.21 KM WEST OF INTERSECTION OF VALLEY STREET AND FM 2952	15164	33.249	-97.84467	0811	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
LAKE BRIDGEPORT WEST FORK CHANNEL 27 M WEST OF STEELE ISLAND 1.07 KM N AND 400 M W OF INTERSECTION OF EL LAGO RD AND BETTY DR	16761	33.23886	-97.87669	0811	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
LAKE BRIDGEPORT MAIN CHANNEL 0.8KM EAST OF RATTLESNAKE ISLAND 636 M N AND 180 M W OF INTERSECTION OF E BAY DR AND PRIVATE RD 1505	16762	33.18853	-97.84647	0811	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
WILLOW CREEK AT WISE COUNTY ROAD 2210 SOUTH OF RUNAWAY BAY	22057	33.11468	-97.86599	0811	04	TR	TD	RT			6	6	6	6	
BIG CREEK AT FM 1810 UPSTREAM OF LAKE BRIDGEPORT	16768	33.3078	-97.919	0811A	03	TR	TD	RT			12	12		12	TRWD Tribs
BEANS CREEK AT FM 1156 5.2KM UPSTREAM OF BRIDGEPORT LAKE EAST OF WIZARD WELLS	16737	33.1999	-97.96761	0811B	03	TR	TD	RT			12	12		12	TRWD Tribs
WEST FORK TRINITY RIVER 30 METERS DOWNSTREAM OF SH 59 NORTHEAST OF JACKSBORO	10972	33.29325	-98.07867	0812	03	TR	TD	RT			12	12	12	12	TRWD Tribs
CHAMBERS CREEK AT FM 1126	10977	32.1975	-96.52139	0814	04	TR	TD	RT		12	12	12	12	12	TRWD Tribs
CHAMBERS CREEK AT ELLIS COUNTY ROAD 55 EAST OF ITALY	22058	32.16471	-96.76196	0814	04	TR	TD	RT		6	6	6	6	6	
CEDAR CREEK RESERVOIR 12 METERS NORTH AND 586 METERS EAST OF INTERSECTION OF ASHBY LANE AND BURLEY LOOP	16747	32.24361	-96.13722	0818	05	TR	TD	BS	2						TRWD Diel

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	24HR	Metals Water	Conventional	Bacteria	Flow	Field	Comment
CEDAR CREEK RESERVOIR 12 METERS NORTH AND 586 METERS EAST OF INTERSECTION OF ASHBY LANE AND BURLEY LOOP	16747	32.24361	-96.13722	0818	05	TR	TD	RT		12	12	4		12	TRWD Routine Intake - Conventionals, Metals in Water, and Bacteria also collected below surface depth (0.3m) at this site.
CEDAR CREEK RESERVOIR 710 M W AND 1.01 M W OF INTERSECTION OF WOODLAWN WAY AND SUNSET BLVD AT CONFLUENCE OF CANEY CK AND CLEAR CK COVES	16748	32.20167	-96.06889	0818	05	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
CEDAR CREEK RESERVOIR 1.01 KM SOUTH AND 1.34 KM WEST OF INTERSECTION OF CAROLYNN ROAD AND OAKVIEW TRAIL	16749	32.2275	-96.09583	0818	05	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
CEDAR CREEK RESERVOIR 1.42 KM NORTH AND 1.37 KM EAST OF INTERSECTION OF NOB HILL ROAD AND SH 334	16753	32.33806	-96.18111	0818	05	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
CEDAR CREEK RESERVOIR NORTH MID LAKE 800 M NORTH AND 2.59 KM EAST OF INTERSECTION OF KAUFMAN CR 4042 AND KAUFMAN CR 4043	16772	32.37695	-96.19111	0818	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
CEDAR CREEK RESERVOIR 1.07 KM EAST AND 40 METERS NORTH OF THE INNER CIRCLE UPPER CHANNEL NEAR INTERSECTION OF HEATHER WOODS DRIVE AND LEISA PLACE IN THE CITY OF TOOL	21427	32.28922	-96.15267	0818	05	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
CEDAR CREEK RESERVOIR SOUTHWEST CORNER AT JCC1 PUMP STATION	22408	32.1859	-96.0956	0818	05	TR	TD	RT		12	12			12	TRWD Routine – Conventionals and Metals in Water also collected below surface depth (0.3m) at this site.
CEDAR CREEK AT FM 1836 NORTHEAST OF KEMP	21559	32.5036	-96.1128	0818B	04	TR	TD	RT		6	6	6	6	12	TRWD Tribs-Field for 6 events will consist of flow severity only
KINGS CREEK AT SH34 UPSTREAM OF CEDAR CREEK RESERVOIR SOUTHWEST OF KAUFMAN 3.44 KM SOUTHWEST ON SH34 FROM US175	21000	32.55644	-96.33894	0818C	04	TR	TD	RT		6	6	6	6	12	TRWD Tribs-Field for 6 events will consist of flow severity only
LACY FORK CREEK 25 METERS UPSTREAM OF FM 90 5.9KM UPSTREAM OF CEDAR CREEK RESERVOIR	16777	32.42477	-96.10918	0818D	04	TR	TD	RT		6	6	6		12	TRWD Tribs-Field for 6 events will consist of flow severity only
PRAIRIE CREEK AT KAUFMAN CR 4006/RODEO ROAD 5.7 KM UPSTREAM OF CEDAR CREEK RESERVOIR WEST OF MABANK	16775	32.36944	-96.12359	0818E	04	TR	TD	RT		6	6	6		12	TRWD Tribs-Field for 6 events will consist of flow severity only
CLEAR CREEK AT US 175 4.3 KM UPSTREAM OF CEDAR CREEK RESERVOIR	16755	32.28854	-95.97271	0818F	05	TR	TD	RT		6	6	6		12	TRWD Tribs-Field for 6 events will consist of flow severity only
NORTH TWIN CREEK AT US 175 3.3KM UPSTREAM OF CEDAR CREEK RESERVOIR	16756	32.34296	-96.0617	0818G	05	TR	TD	RT		6	6	6		12	TRWD Tribs-Field for 6 events will consist of flow severity only

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	24HR	Metals Water	Conventional	Bacteria	Flow	Field	Comment
SOUTH TWIN CREEK AT US 175 5.0KM UPSTREAM OF CEDAR CREEK RESERVOIR	16757	32.32212	-96.02893	0818H	05	TR	TD	RT		6	6	6		12	TRWD Tribs-Field for 6 events will consist of flow severity only
CANEY CREEK AT US 175 8.4KM UPSTREAM OF CEDAR CREEK RESERVOIR NORTHWEST OF ATHENS	16758	32.23912	-95.90191	0818I	05	TR	TD	RT		6	6	6		12	TRWD Tribs-Field for 6 events will consist of flow severity only
LAKE ARLINGTON MID LAKE 177 METERS NORTH AND 865 METERS WEST OF INTERSECTION OF ARBOR VALLEY DRIVE AND PERKINS ROAD	11042	32.70278	-97.20834	0828	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
LAKE ARLINGTON USGS SITE FC 570 METERS EAST OF INTERSECTION OF KAY DRIVE AND KALTENBRUN ROAD	13897	32.67806	-97.22945	0828	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
LAKE ARLINGTON USGS SITE EC 254 METERS SOUTH AND 493 METERS EAST OF INTERSECTION OF CRAVENS ROAD AND WILBARGER STREET	13899	32.69528	-97.22278	0828	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
LK ARLINGTON USGS SITE AC ID 324304097113601 LOCATION MATCHES SITE MAP 518 M N AND 507 M W INTERSECT OF LK ARLINGTON BLVD AND GREEN OAK	13904	32.71778	-97.19334	0828	04	TR	TD	RT		5	5	4		5	TRWD Routine Intake - Conventionals, Metals in Water, and Bacteria also collected below surface depth (0.3m) at this site.
LK ARLINGTON USGS SITE AC ID 324304097113601 LOCATION MATCHES SITE MAP 518 M N AND 507 M W INTERSECT OF LK ARLINGTON BLVD AND GREEN OAK	13904	32.71778	-97.19334	0828	04	TR	TD	BS	2						TRWD Diel
VILLAGE CREEK IMMEDIATELY DOWNSTREAM OF RENDON ROAD SW OF ARLINGTON	10786	32.60328	-97.2647	0828A	04	TR	TD	RT		12	12	12	12	12	TRWD Tribs
BENBROOK LAKE USGS SITE CR 92 METERS NORTH AND 1.27 KM EAST OF INTERSECTION OF PENINSULA ROAD AND PLOVER ROAD	13832	32.60778	-97.46417	0830	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
BENBROOK LAKE EAST END OF DAM 285 METERS SOUTH AND 332 METERS WEST OF INTERSECTION OF PECAN VALLEY DRIVE AND LAKESIDE DRIVE	15151	32.64947	-97.45123	0830	04	TR	TD	RT		5	5	4		5	TRWD Routine Intake - Conventionals, Metals in Water, and Bacteria also collected below surface depth (0.3m) at this site.
BENBROOK LAKE EAST END OF DAM 285 METERS SOUTH AND 332 METERS WEST OF INTERSECTION OF PECAN VALLEY DRIVE AND LAKESIDE DRIVE	15151	32.64947	-97.45123	0830	04	TR	TD	BS	2						TRWD Diel
BENBROOK LAKE 1.36 KM NORTH AND 223 METERS WEST OF INTERSECTION OF ST FRANCIS VILLAGE RD AND ST ANTHONY DR EAST SIDE IN MAIN CHANNEL	15156	32.62811	-97.45664	0830	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	24HR	Metals Water	Conventional	Bacteria	Flow	Field	Comment
BENBROOK LAKE EAST OF BOAT RAMP AT HOLIDAY PARK IN MAIN CHANNEL 1.21 KM N AND 58 M E OF INTERSECTION OF PENINSULA RD AND BEAR CREEK DR	15158	32.61817	-97.48853	0830	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
ROCK CREEK AT FM 1187 3.7KM UPSTREAM OF BENBROOK LAKE	16725	32.56955	-97.44936	0830A	04	TR	TD	RT			12			12	TRWD Tribs
BEAR CREEK AT FM 1187 NEAR BENBROOK	13624	32.59393	-97.51337	0830B	04	TR	TD	RT			12		12	12	TRWD Tribs
CLEAR FORK TRINITY RIVER AT KELLY ROAD 8.7KM UPSTREAM OF US 377 SOUTH OF ALEDO	16414	32.6534	-97.58665	0831	04	TR	TD	RT			12		12	12	TRWD Tribs
RICHLAND-CHAMBERS RESERVOIR RICHLAND CREEK ARM MID LAKE 2.24 KM SOUTH AND 276 METERS EAST OF INTERSECTION OF PETTY RD AND SE 2230 RD	11068	31.97356	-96.25613	0836	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
RICHLAND-CHAMBERS RESERVOIR AT NORTH END OF DAM 332 METERS SOUTH AND 555 METERS WEST OF INTERSECTION OF US 287 AND RR 488	15168	31.96875	-96.09664	0836	09	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
RICHLAND-CHAMBERS RESERVOIR 1.95 KM NORTH AND 2.26 KM WEST OF INTERSECTION OF SE 3190 ROAD AND OLD HIGHWAY 287	15169	31.97439	-96.19151	0836	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
RICHLAND-CHAMBERS RESERVOIR CHAMBERS CREEK ARM NEAR TCWCID 1 PUMP STATION 570 M S AND 1.16 KM W OF INTERSECT OF SE 3240 AND SE 3250	15170	32.04117	-96.2075	0836	04	TR	TD	RT		12	12	4		12	TRWD Routine Intake - Conventionals, Metals in Water, and Bacteria also collected below surface depth (0.3m) at this site.
RICHLAND-CHAMBERS RESERVOIR CHAMBERS CREEK ARM NEAR TCWCID 1 PUMP STATION 570 M S AND 1.16 KM W OF INTERSECT OF SE 3240 AND SE 3250	15170	32.04117	-96.2075	0836	04	TR	TD	BS	2						TRWD Diel
RICHLAND-CHAMBERS RESERVOIR IN UPPER END OF RICHLAND CREEK ARM 2.01 KM S AND 150 METERS E OF INTERSECTION OF NAVARRO SLAB AND SE 1095	15172	31.93597	-96.35472	0836	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
RICHLAND-CHAMBERS RESERVOIR UPPER END OF CHAMBERS CREEK ARM 2.52 KM NORTH AND 329 METERS WEST OF INTERSECTION OF WICHITA TRL AND FM 637	15199	32.07747	-96.3407	0836	04	TR	TD	RT			5	4		5	TRWD Routine - Conventionals and Bacteria also collected below surface depth (0.3m) at this site.
RICHLAND CREEK AT SW 0030 RD UPSTREAM OF RICHLAND-CHAMBERS RESERVOIR	16721	31.96711	-96.47503	0836	04	TR	TD	RT		12	12	12		12	TRWD Tribs

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	24HR	Metals Water	Conventional	Bacteria	Flow	Field	Comment
POST OAK CREEK 109 METERS DOWNSTREAM OF POWELL PIKE EAST OF CORSICANA	17847	32.09709	-96.40845	0836D	04	TR	TD	RT		12	12	12	12	12	TRWD Tribs
TARRANT REGIONAL WATER DISTRICT - OUT OF BASIN															
LAKE PALESTINE IN BLACKBURN BAY APPROX 550 METERS EAST AND 340 METERS NORTH OF THE INTERSECTION OF ANDERSON COUNTY ROAD 3009 AND PRIVATE ROAD 7010	22056	32.06727	-95.43914	0605	05	TR	TD	RT		5	5	5		5	Out of Basin Intake - Conventionals, Metals in Water, and Bacteria also collected below surface depth (0.3m) at this site.

Trinity River Authority

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	24HR	Aquatic Habitat	Benthics	Nekton	Metals Water	Conventional	Bacteria	Flow	Field	Comment
TRINITY RIVER AUTHORITY																		
TRINITY RIVER IMMEDIATELY DOWNSTREAM OF US 79 NORTHEAST OF OAKWOOD	10919	31.648333	-95.789566	0804	05	TR	TR	RT					2	4	4	4	4	TRA Routine - Long term monitoring.
TRINITY RIVER AT SH 31 IN TRINIDAD	10922	32.1478	-96.102554	0804	04	TR	TR	RT					2	4	4	4	4	TRA Routine - Long term monitoring.
TOWN CREEK 73 METERS UPSTREAM OF FM 645 SOUTHWEST OF PALESTINE	10706	31.722422	-95.758377	0804L	05	TR	TR	RT						4	4	4	4	TRA Routine - Long term monitoring.
TRINITY RIVER 50 METERS DOWNSTREAM OF SH 34 NORTHEAST OF ENNIS	10925	32.426666	-96.462502	0805	04	TR	TR	RT					2	4	4	4	4	TRA Routine - Long term monitoring.
TRINITY RIVER IMMEDIATELY DOWNSTREAM OF MALLOY BRIDGE ROAD EAST OF WILMER	10929	32.596668	-96.587502	0805	04	TR	TR	RT						4	4	4	4	Targeted Monitoring - IR - Added in FY2023 to be sampled for at least 3 years (through FY2025) to address nutrient concerns. Reevalute for FY2026.
TRINITY RIVER AT SOUTH LOOP SH 12 SOUTH OF DALLAS	10934	32.707363	-96.735703	0805	04	TR	TR	RT					2	4	4	4	4	TRA Routine - Long term monitoring.
TRINITY RIVER 46 METERS UPSTREAM OF N WESTMORELAND ROAD IN DALLAS	10937	32.797981	-96.874466	0805	04	TR	TR	RT					2	4	4	4	4	TRA Routine - Long term monitoring.
TEN MILE CREEK 30 METERS UPSTREAM OF PARKINSON RD AND THE TRA TMC WWTP OUTFALL ABOVE THE MIXING ZONE	21287	32.563721	-96.624651	0805	04	TR	TR	RT						4	4	4	4	Targeted Monitoring - Coverage Gaps - Added in FY2020 for a minimum of 5 years (through FY2024). Reevaluate for FY2025. Likely to become a long term site.
RED OAK CREEK 111 METERS DOWNSTREAM OF SHAWNEE ROAD	10842	32.493694	-96.807503	0805A	04	TR	TR	RT						4	4	4	4	Targeted Monitoring - Coverage Gaps - Added in FY2020 for a minimum of 5 years (through FY2024). Reevaluate for FY2025.
BARDWELL RESERVOIR 1.91 KM EAST AND 787 METERS NORTH OF INTERSECTION OF BARDWELL DAM RD AND FM 985 MID LAKE NEAR DAM USGS SITE AC	10979	32.252777	-96.64167	0815	04	TR	TR	RT						4	4		4	TRA Routine - Long term monitoring.
WAXAHACHIE CREEK AT GELZENDANER ROAD	13686	32.30735	-96.738716	0815A	04	TR	TR	RT						4	4	4	4	TRA Routine - RC WPP - Long term monitoring.
LAKE WAXAHACHIE 474 METERS NORTH AND 143 METERS EAST OF INTERSECTION OF OLD HOWARD LANE AND PENN ROAD MID LAKE NEAR DAM	10980	32.33889	-96.804169	0816	04	TR	TR	RT						4	4		4	TRA Routine - Long term monitoring.

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	24HR	Aquatic Habitat	Benthics	Nekton	Metals Water	Conventional	Bacteria	Flow	Field	Comment
BUFFALO CREEK AT KING STREET	10826	32.817307	-96.452896	0819B	04	TR	TR	RT						4	4	4	4	Targeted Monitoring - IR - Added in FY2022 to address TP and Nitrate concerns 6 times a year for 2 years (through FY2023). Reevaluated for continued monitoring at a quarterly frequency in FY2024 due to continued elevated levels of TP and Nitrate and elev
LAKE RAY HUBBARD EAST FORK ARM 80 METERS NORTH AND 843 METERS WEST OF INTERSECTION OF SUNSET HILL DR AND BAYHILL DR	11004	32.940277	-96.49028	0820	04	TR	TR	RT						4	4		4	Targeted Monitoring - Coverage Gap - Added in FY2021 to be sampled for at least 5 years (through FY2025). Reevalute for FY2026.
LAKE RAY HUBBARD ROWLETT CREEK ARM 523 METERS SOUTH AND 374 METERS WEST OF INTERSECTION OF THORNHILL WAY AND ROWLETT ROAD	11010	32.872223	-96.573608	0820	04	TR	TR	RT						4	4		4	Targeted Monitoring - Coverage Gap - Added in FY2021 to be sampled for at least 5 years (through FY2025). Reevalute for FY2026.
LAKE RAY HUBBARD MUDDY CREEK ARM 104 METERS SOUTH AND 241 METERS WEST OF INTERSECTION OF GARNER ROAD AND C A ROAN DRIVE	11016	32.885834	-96.542778	0820	04	TR	TR	RT						4	4		4	Targeted Monitoring - Coverage Gap - Added in FY2021 to be sampled for at least 5 years (through FY2025). Reevalute for FY2026.
ROWLETT CREEK 45 METERS DOWNSTREAM OF BEN DAVIS/DAMASCUS RD RIVER KM 8.5	10756	32.959103	-96.611092	0820B	04	TR	TR	RT						4	4	4	4	TRA Routine - Rowlett WPP - Long term monitoring.
ELM FORK TRINITY RIVER AT WILDWOOD DRIVE-TOMBRANIFF DRIVE IN DALLAS	20287	32.856	-96.9161	0822	04	TR	TR	RT					2	4	4	4	4	TRA Routine - Long term monitoring.
LEWISVILLE LAKE USGS SITE EC 362 METERS NORTH AND 536 METERS WEST OF INTERSECTION OF MAIN STREET AND WEST PARK STREET	14002	33.166389	-96.948059	0823	04	TR	TR	RT						4	4		4	Targeted Monitoring - Coverage Gap - Added in FY2021 to be sampled for at least 5 years (through FY2025). Reevalute for FY2026.
LEWISVILLE LAKE MID LAKE NEAR PECAN CREEK ARM 366 METERS SOUTH AND 1.24 KM EAST OF INTERSECTION OF EAST MCKINNEY STREET AND CAMP COPASS	17839	33.18111	-97.026665	0823	04	TR	TR	RT						4	4		4	Targeted Monitoring - Coverage Gap - Added in FY2021 to be sampled for at least 5 years (through FY2025). Reevalute for FY2026.

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	24HR	Aquatic Habitat	Benthics	Nekton	Metals Water	Conventional	Bacteria	Flow	Field	Comment
DENTON CREEK IMMEDIATELY DOWNSTREAM OF SH 121 SOUTH OF LEWISVILLE	11034	32.987087	-97.012497	0825	04	TR	TR	RT							4	4	4	Targeted Monitoring - IR - Added in FY2020 to be sampled for at least 5 years (through FY2024) for *E. coli* concerns. Reevalute for FY2025.
GRAPEVINE RESERVOIR AT MOREHEAD CREEK COVE 443 METERS NORTH AND 120 METERS EAST OF INTERSECTION OF PARK ROAD 8 AND DOOLEY STREET	11036	32.961388	-97.074165	0826	04	TR	TR	RT						4	4		4	Targeted Monitoring - IR - Added in FY2022 for 2 years (through FY2023) to address algal growth concern. Reevaluated in 2024 and continuing monitoring for 2 more years at a quarterly frequency (through FY 2025). Reevaluate for FY2026.
GRAPEVINE LAKE MID LAKE NORTH OF OAK GROVE PARK 1.26 KM NORTH AND 269 METERS EAST OF INTERSECTION OF MESQUITE BEND AND PARK ROAD	16114	32.98111	-97.078613	0826	04	TR	TR	RT						4	4		4	Targeted Monitoring - Coverage Gap & IR - Added in FY2021 to be sampled for at least 5 years (through FY2025) to address carryforward pH listing. Reevalute for FY2026.
GRAPEVINE LAKE AT MOUTH OF NORTH MAIN SLOUGH COVE 749 METERS N AND 149 METERS W OF INTERSECTION OF OAK GROVE PARK RD AND DOVE LOOP RD	16116	32.971943	-97.091942	0826	04	TR	TR	RT						4	4		4	Targeted Monitoring - IR - Added in FY2022 for 2 years (through FY2023) to address algal growth concern. Reevaluated in 2024 and continuing monitoring for 2 more years at a quarterly frequency (through FY 2025). Reevaluate for FY2026.
GRAPEVINE LAKE DOVE CREEK COVE MIDDLE OF COVE APPROX 250 METERS SOUTH AND 280 METERS EAST OF THE INTERSECTION OF PERCH E LANE AND MEADOWMERE LANE-SNAKEY ROAD	20884	32.980042	-97.113139	0826	04	TR	TR	RT						4	4		4	Targeted Monitoring - IR - Added in FY2022 for 2 years (through FY2023) to address algal growth concern. Reevaluated in 2024 and continuing monitoring for 2 more years at a quarterly frequency (through FY 2025). Reevaluate for FY2026.

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	24HR	Aquatic Habitat	Benthics	Nekton	Metals Water	Conventional	Bacteria	Flow	Field	Comment
GRAPEVINE LAKE AT MURRELL PARK E 60 METERS EAST AND 40 METERS SOUTH OF BOAT RAMP 1 NEAR GRAPEVINE	21351	32.99266	-97.08385	0826	04	TR	TR	RT						4	4		4	Targeted Monitoring - IR - Added in FY2022 for 2 years (through FY2023) to address algal growth concern. Reevaluated in 2024 and continuing monitoring for 2 more years at a quarterly frequency (through FY 2025). Reevaluate for FY2026.
GRAPEVINE LAKE UPSTREAM END MID LAKE 1.37 KM NORTH AND 1.18 KM EAST OF INTERSECTION OF WHITE CHAPEL ROAD AND BOB JONES ROAD	22234	33.01038	-97.143988	0826	04	TR	TR	RT						4	4		4	Targeted Monitoring - Coverage Gap & IR - Added in FY2021 to be sampled for at least 5 years (through FY2025) to address carryforward pH listing. Reevalute for FY2026.
DENTON CREEK 30 METERS UPSTREAM OF THE CONFLUENCE WITH CADE BRANCH ABOVE THE MIXING ZONE	21295	33.028816	-97.22006	0826A	04	TR	TR	RT						4	4	4	4	Targeted Monitoring - IR - Added in FY2022 for 2 years (through FY2023) to address Nitrate concern. Potentially split AU at Cade Branch. Reevaluated in 2024 and continuing monitoring for 2 more years at a quarterly frequency (through 2025). Reevaluate for 2026.
DENTON CREEK 100 METERS DOWNSTREAM OF THE CONFLUENCE WITH CADE BRANCH BELOW THE MIXING ZONE	21296	33.028472	-97.218787	0826A	04	TR	TR	RT						4	4	4	4	Targeted Monitoring - IR - Added in FY2022 for 2 years (through FY2023) to address Nitrate concern. Potentially split AU at Cade Branch. Reevaluated in 2024 and continuing monitoring for 2 more years at a quarterly frequency (through 2025). Reevaluate for 2026.
WHITE ROCK CREEK AT IH635 NORTH SERVICE ROAD IMMEDIATELY WEST OF PARK CENTRAL DRIVE	20289	32.9248	-96.7817	0827A	04	TR	TR	RT					2	4	4	4	4	TRA Routine - Long term monitoring.
CEDAR CREEK AT FM 637 SOUTHEAST OF CORSICANA	22054	32.049119	-96.319439	0836B	04	TR	TR	RT	5							5		Targeted Monitoring - IR - Added in FY2024 for 2 years (through FY2025) to address DO impairment. Reevaluate for FY2026.

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	24HR	Aquatic Habitat	Benthics	Nekton	Metals Water	Conventional	Bacteria	Flow	Field	Comment
GRAPE CREEK AT NAVARRO COUNTY ROAD SE CR 1080 SOUTHEAST OF CORSICANA	22055	31.969181	-96.379872	0836C	04	TR	TR	RT	5							5		Targeted Monitoring - IR - Added in FY2024 for 2 years (through FY2025) to address DO impairment. Reevaluate for FY2026.
JOE POOL LAKE MOUNTAIN CREEK ARM AT LAKE RIDGE PKWY/MANSFIELD ROAD 251 M N AND 1.19 KM W OF INTERSECTION OF ANDERSON RD AND LK RIDGE USGS SITE DC 323503097012201	11071	32.584167	-97.023056	0838	04	TR	TR	RT						4	4		4	TRA Routine - Long term monitoring.
JOE POOL LAKE WALNUT CREEK ARM AT LAKE RIDGE PARKWAY 1.43 KM NORTH AND 503 M WEST OF INTERSECTION OF LAKE RIDGE PKWY AND HANGER LOWE RD	11072	32.61972	-97.040001	0838	04	TR	TR	RT						4	4		4	TRA Routine - Long term monitoring.
JOE POOL LAKE MID LAKE AT DAM 48 METERS SOUTH AND 2.24 KM WEST OF INTERSECTION OF MANSFIELD ROAD AND FM 1382	11073	32.640278	-96.996666	0838	04	TR	TR	RT						4	4		4	TRA Routine - Long term monitoring.
BOWMAN BRANCH AT SOUTH SH 360 IN THE CITY OF GRAND PRAIRE IN TARRANT COUNTY	22133	32.623383	-97.071337	0838	04	TR	TR	RT						4	4	4	4	TRA Routine - Long term monitoring.
MOUNTAIN CREEK AT US287 1.6KM NORTHWEST OF INTERSECTION OF US 287 AND FM 661	16434	32.512783	-97.067558	0838A	04	TR	TR	RT						4	4	4	4	TRA Routine - Long term monitoring.
REECE BRANCH AT FM 511 SOUTHEAST OF MANSFIELD APPROXIMATELY 908 METERS UPSTREAM OF THE CONFLUENCE WITH MOUNTAIN CREEK	22394	32.510028	-97.097346	0838A	04	TR	TR	RT						4	4	4	4	TRA Routine - Long term monitoring.
WALNUT CREEK AT MATLOCK ROAD 2.6 MI NORTHEAST OF MANSFIELD	13621	32.58086	-97.102135	0838C	04	TR	TR	RT						4	4	4	4	TRA Routine - Long term monitoring.
HOLLINGS BRANCH AT TANGLE RIDGE ROAD 1KM UPSTREAM OF CONFLUENCE OF HOLLINGS BRANCH WITH JOE POOL LAKE	16433	32.560001	-97.022781	0838D	04	TR	TR	RT						4	4	4	4	TRA Routine - Long term monitoring.
SOAP CREEK 1.1 KILOMETERS UPSTREAM OF THE CONFLUENCE WITH MOUNTAIN CREEK IN ELLIS COUNTY	22134	32.525396	-97.052778	0838E	04	TR	TR	RT						4	4	4	4	TRA Routine - Long term monitoring.
RAY ROBERTS LAKE USGS SITE BC 444 METERS NORTH AND 2.21 KM EAST OF INTERSECTION OF FM 1190 AND JONES ROAD	14041	33.38361	-97.084999	0840	04	TR	TR	RT						4	4		4	Targeted Monitoring - Coverage Gap - Added in FY2021 to be sampled for at least 5 years (through FY2025). Reevalute for FY2026.

Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	24HR	Aquatic Habitat	Benthics	Nekton	Metals Water	Conventional	Bacteria	Flow	Field	Comment
RAY ROBERTS LAKE UPPER PORTION OF JORDAN CREEK ARM 1.87 KM SOUTH AND 2.11 KM EAST OF INTERSECTION OF BLOOMFIELD ROAD AND FM 372	22235	33.433075	-96.992531	0840	04	TR	TR	RT						4	4		4	Targeted Monitoring - Coverage Gap - Added in FY2021 to be sampled for at least 5 years (through FY2025). Reevalute for FY2026.
LOWER WEST FORK TRINITY RIVER AT BELT LINE ROAD IN GRAND PRAIRE	11081	32.762913	-96.995033	0841	04	TR	TR	RT					2	4	4	4	4	TRA Routine - Long term monitoring.
DALWORTH CREEK AT PRESIDENT GEORGE BUSH TURNPIKE/SH 161 IN GRAND PRAIRIE	21557	32.750289	-97.027983	0841G	04	TR	TR	RT							4	4	4	Targeted Monitoring - IR - Added in FY2023 to be sampled for at least 5 years (through FY2027) for nutrient concerns. Reevalute for FY2028.
FISH CREEK SOUTH BRANCH AT GREAT SOUTHWEST PARKWAY/LAKERIDGE PARKWAY IN GRAND PRAIRIE	15294	32.659238	-97.041967	0841K	04	TR	TR	RT	5							5		Targeted Monitoring - IR - Added in FY2023 to be sampled for at least 2 years (through FY2024). Reevalute for FY2025.
MOUNTAIN CREEK IMMEDIATELY DOWNSTREAM OF SINGLETON BLVD IN GRAND PRAIRIE	10815	32.778774	-96.926323	0841O	04	TR	TR	RT						4	4	4	4	Targeted Monitoring - IR - Added in FY2022 for a minimum of 5 years (through FY 2026) for *E. coli*, chlorophyll and NH3 concerns. Reevaluate for FY2027.
CLEAR FORK TRINITY RIVER AT FORT WORTH BRANCH TRINITY TRAILS FOOT BRIDGE NEAR MEMORIAL OAK PARKING AREA	22097			0829	04	TR	TR	BS	2	2	2	2				2	2	ALM

Upper Trinity Regional Water District

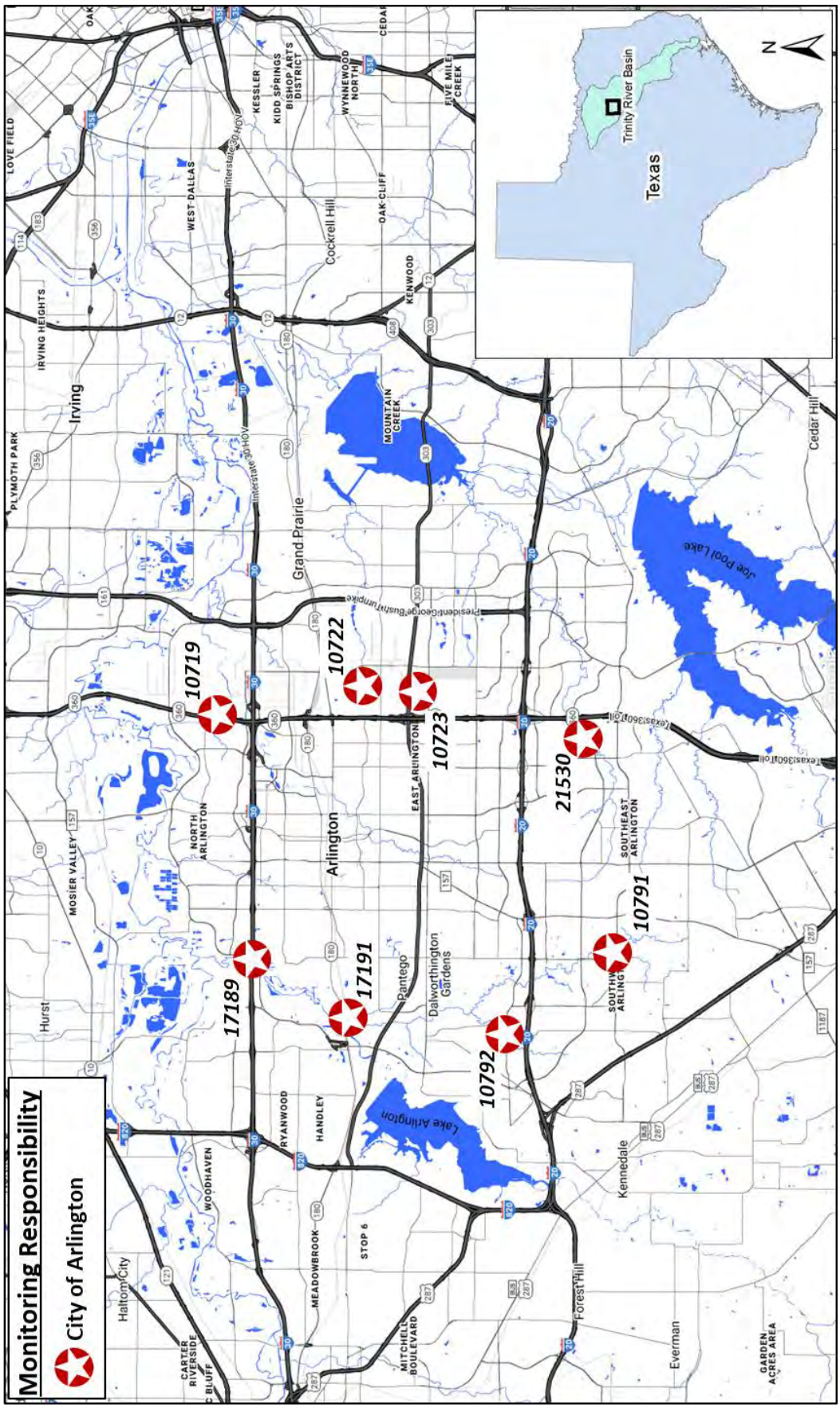
Site Description	Site ID	Latitude	Longitude	Waterbody ID	Region	SE	CE	MT	Conventional	Bacteria	Flow	Field	Comment
UPPER TRINITY REGIONAL WATER DISTRICT													
PECAN CREEK 27 METERS DOWNSTREAM OF FM 428 4.0 MI EAST OF AUBREY	13616	33.29724	-96.91876	0823	04	TR	UW	RT	4	4	4	4	
MUSTANG CREEK AT FM 428 AND 4.7 MILES EAST OF AUBREY	22243	33.29613	-96.90502	0823	04	TR	UW	RT	4	4	4	4	
RUNNING BRANCH AT UPSTREAM SIDE OF FISHTRAP ROAD AND IMMEDIATELY UPSTREAM OF LEWISVILLE LAKE EAST OF CROSS ROADS	22244	33.23304	-96.95158	0823	04	TR	UW	RT	4	4	4	4	Sampling at upstream side only, DS drops to lake pool
LITTLE ELM CREEK AT FM 1385 5.5 MI EAST OF AUBREY 1.5 MI UPSTREAM FROM MUSTANG CREEK	13617	33.28339	-96.89252	0823A	04	TR	UW	RT	4	4	4	4	
DOE BRANCH EAST CHANNEL AT FISHTRAP ROAD TWO MILES WEST OF PROSPER	22245	33.23002	-96.88253	0823D	04	TR	UW	RT	4	4	4	4	

Appendix C: Station Location Maps

Station Location Maps

Maps of stations monitored by the TRA and WBPA's are provided below. The maps were generated by the TRA. 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 Angela Kilpatrick at kilpatricka@trinityra.org.

City of Arlington



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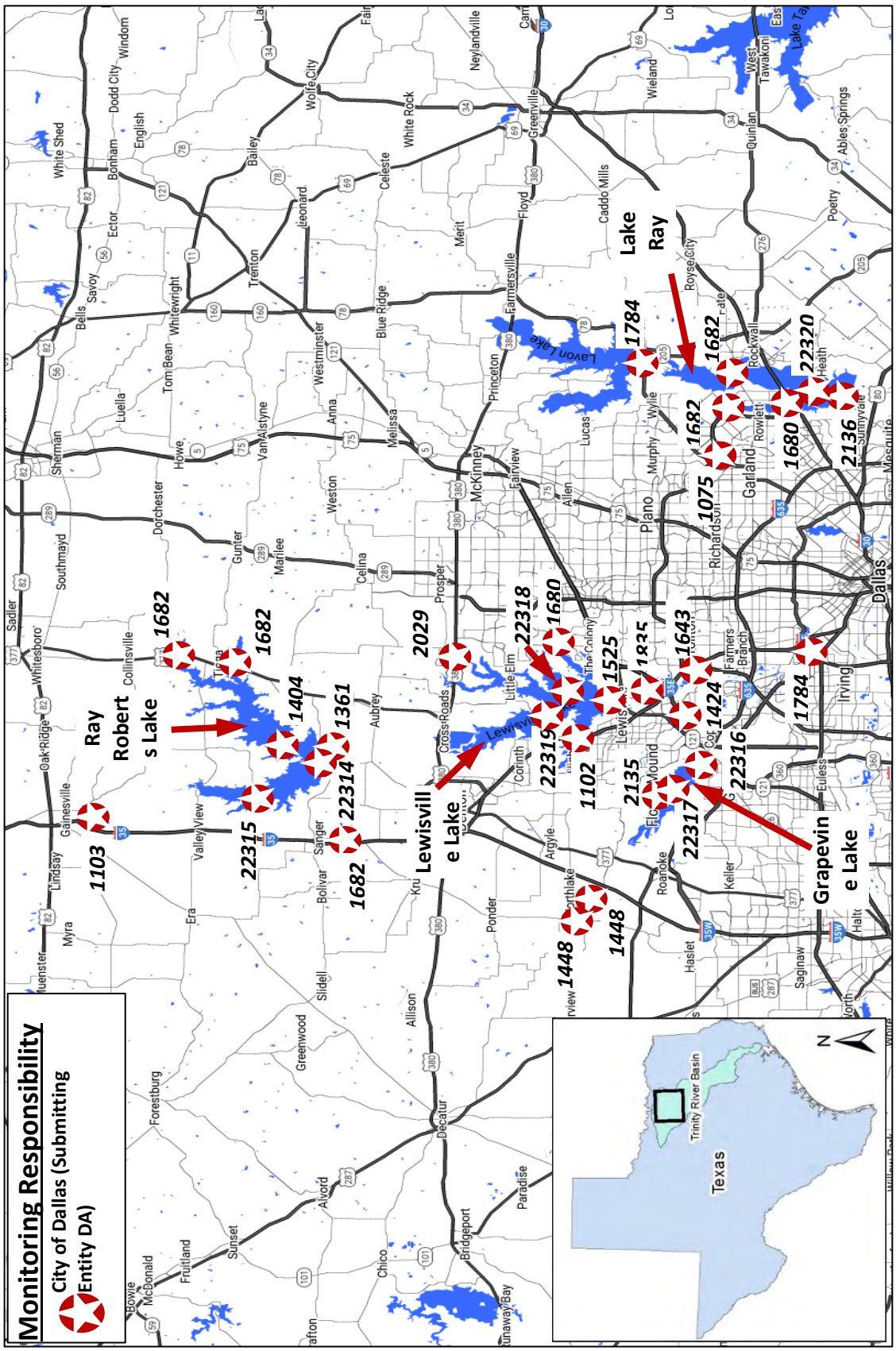
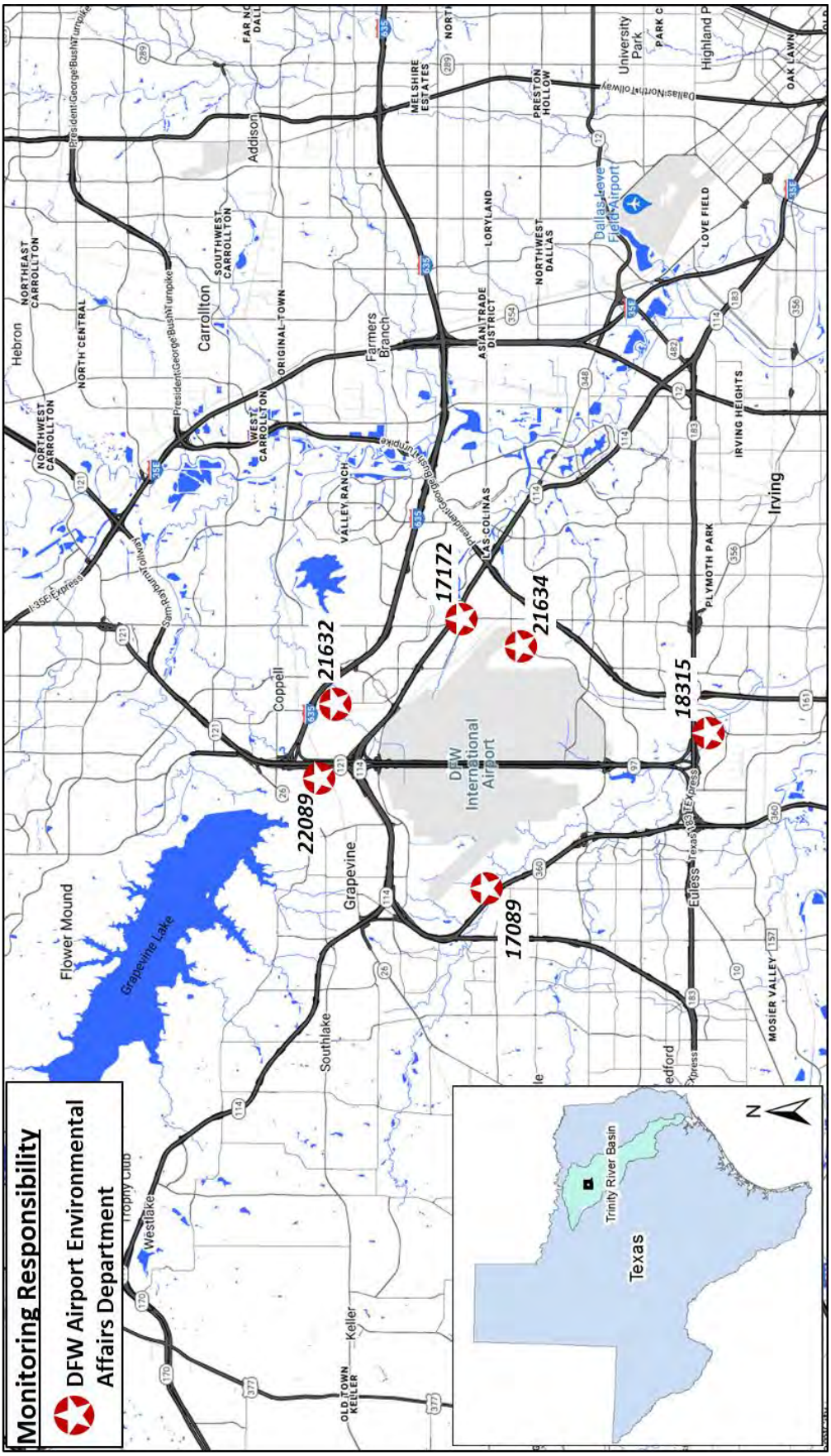


DFW Airport EAD



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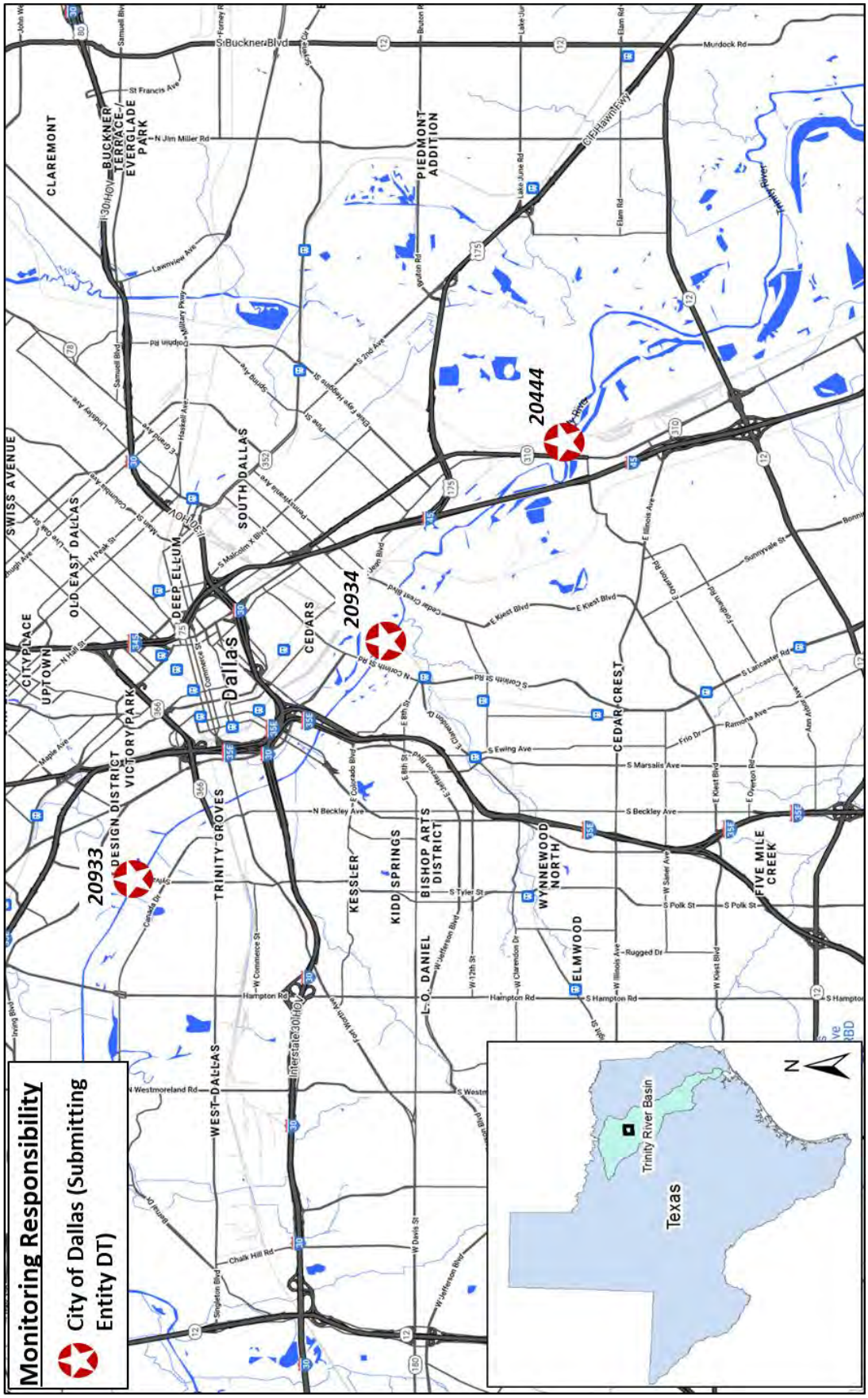
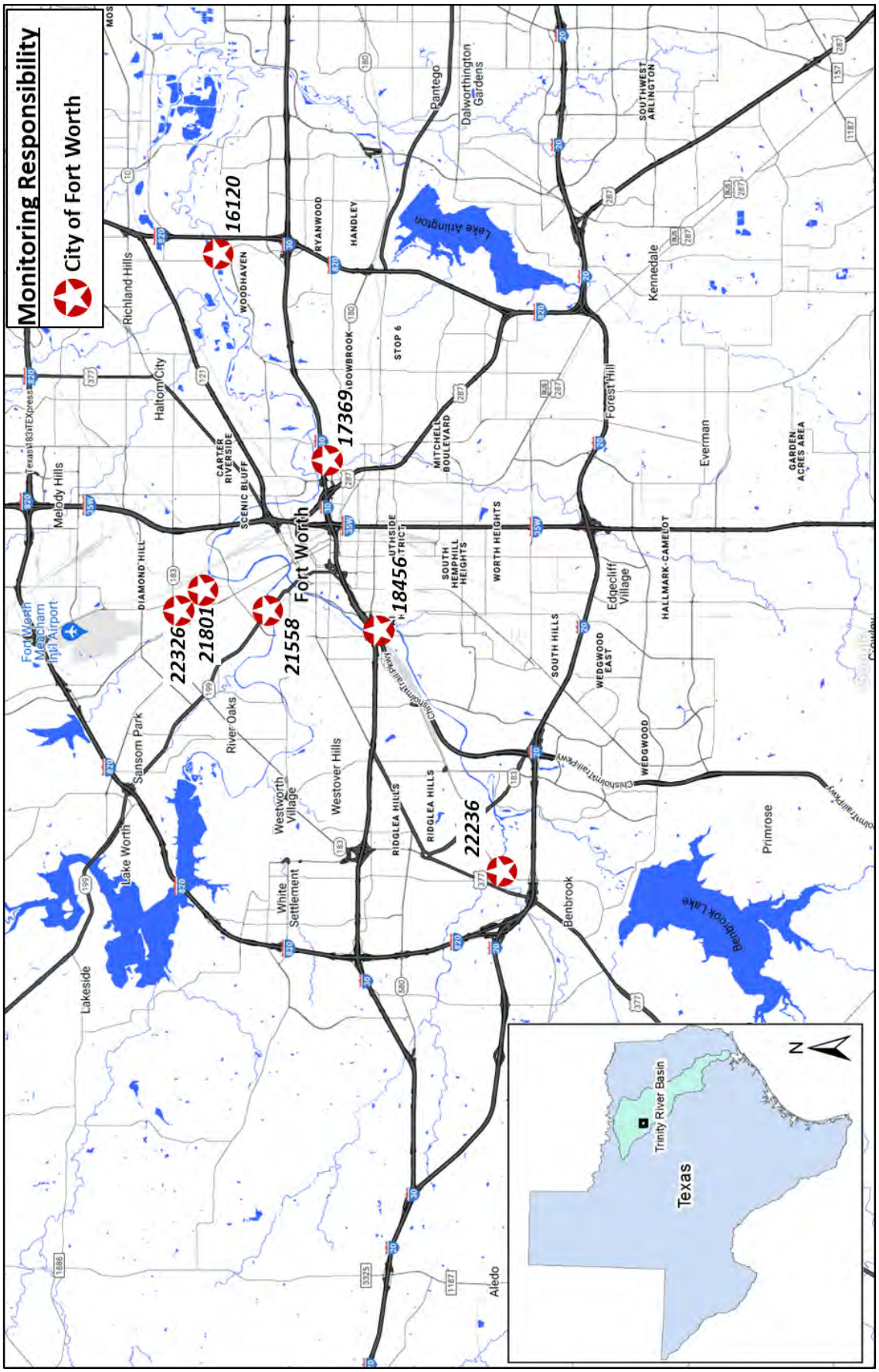
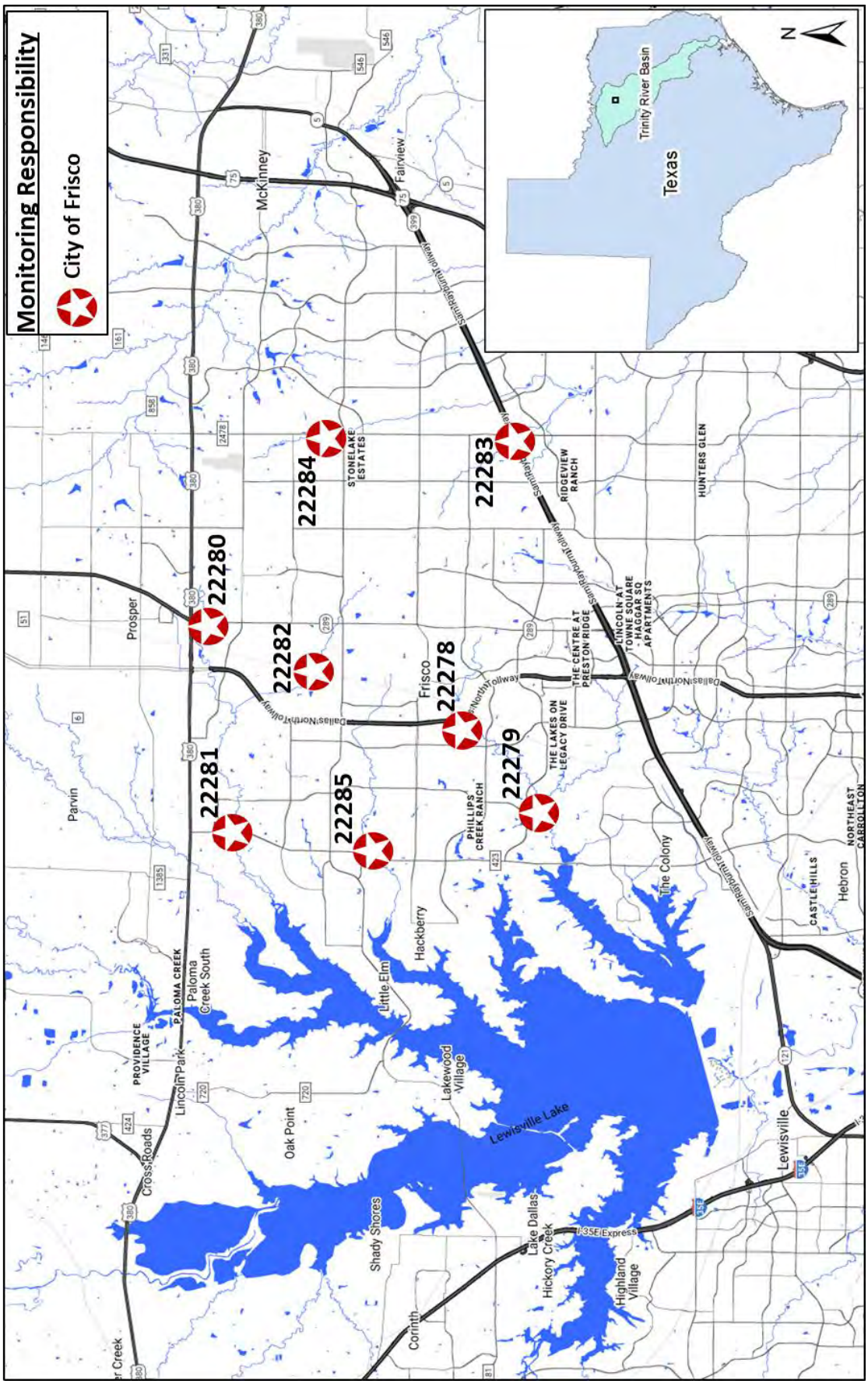


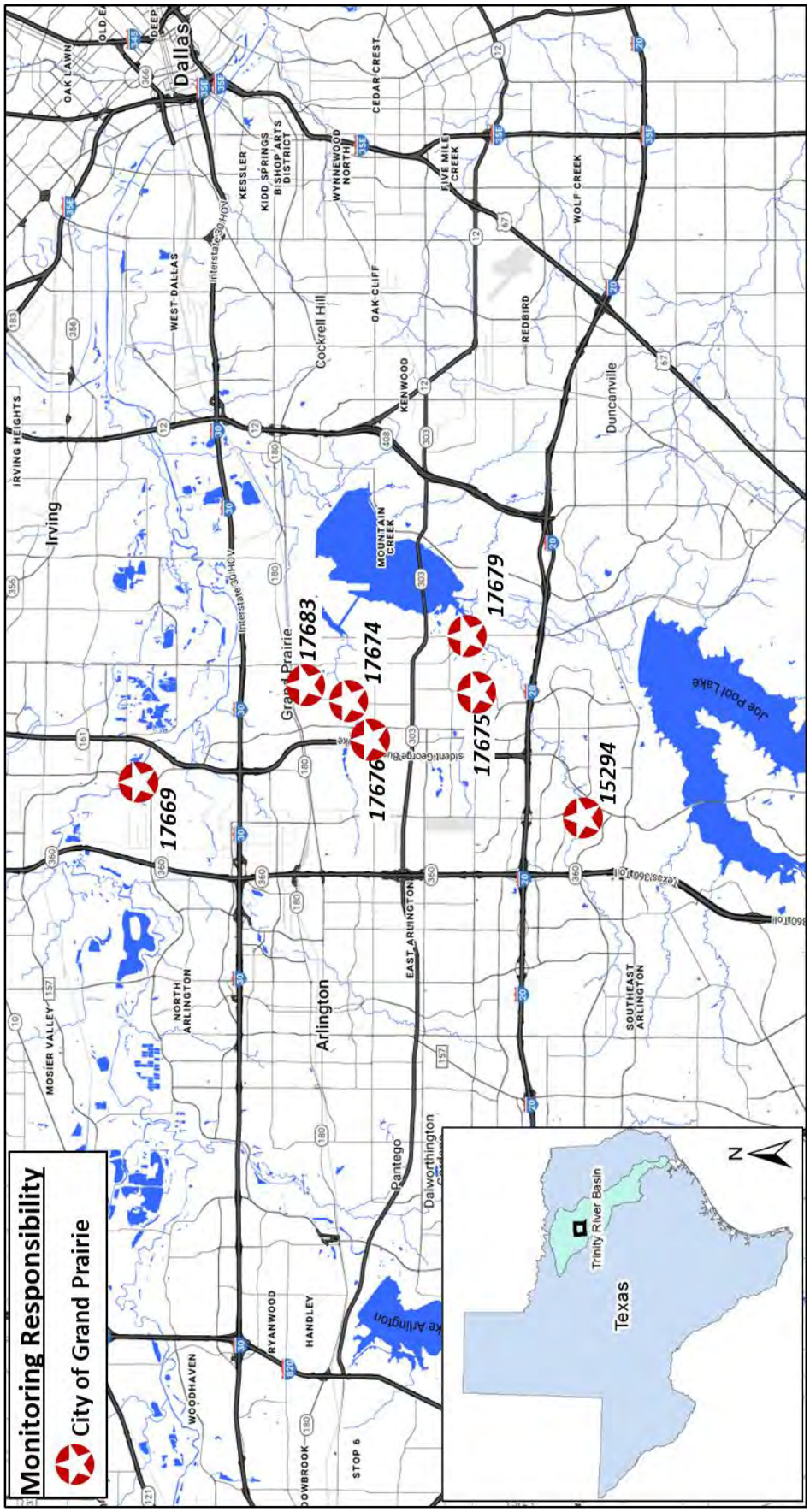
City of Fort Worth



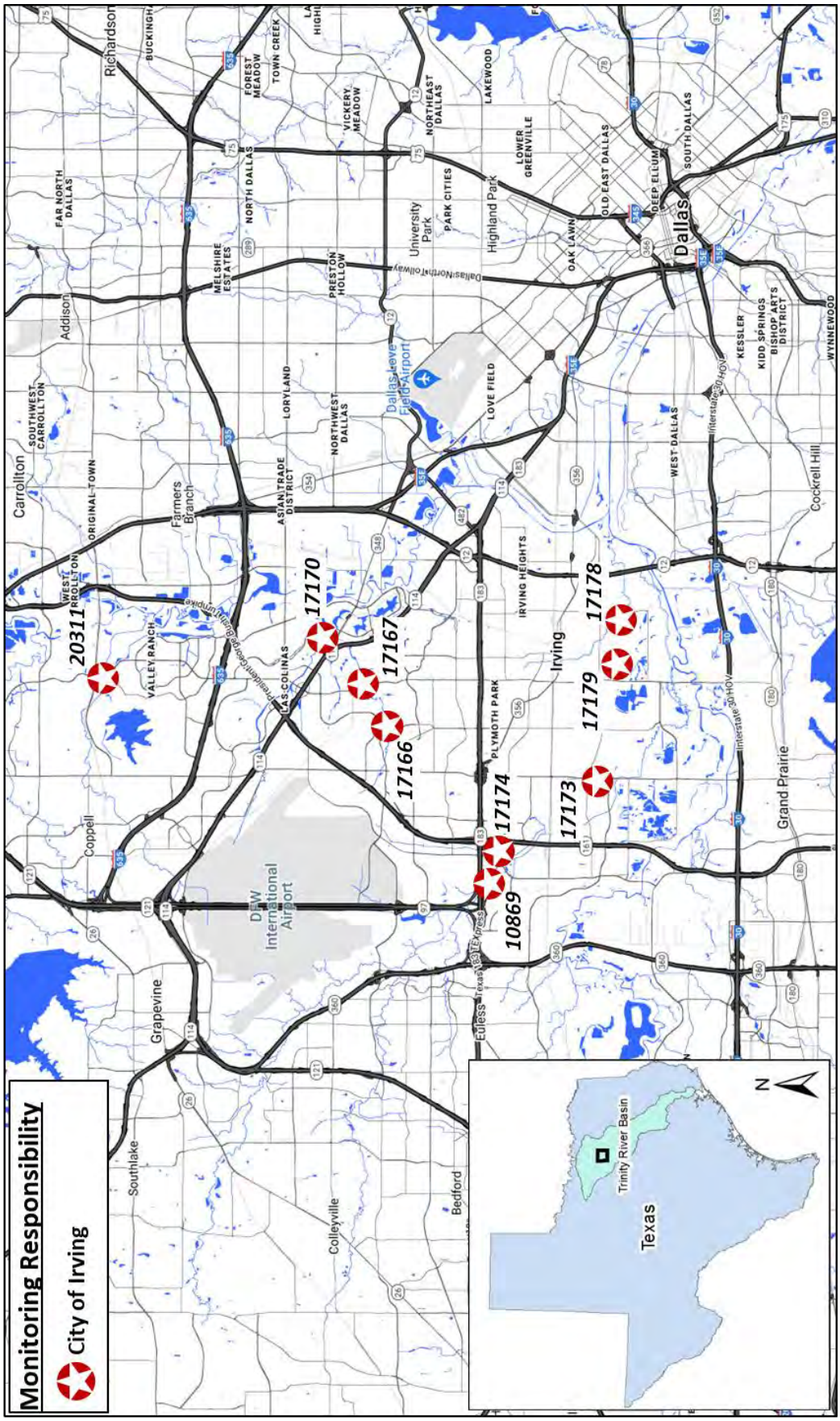
City of Frisco



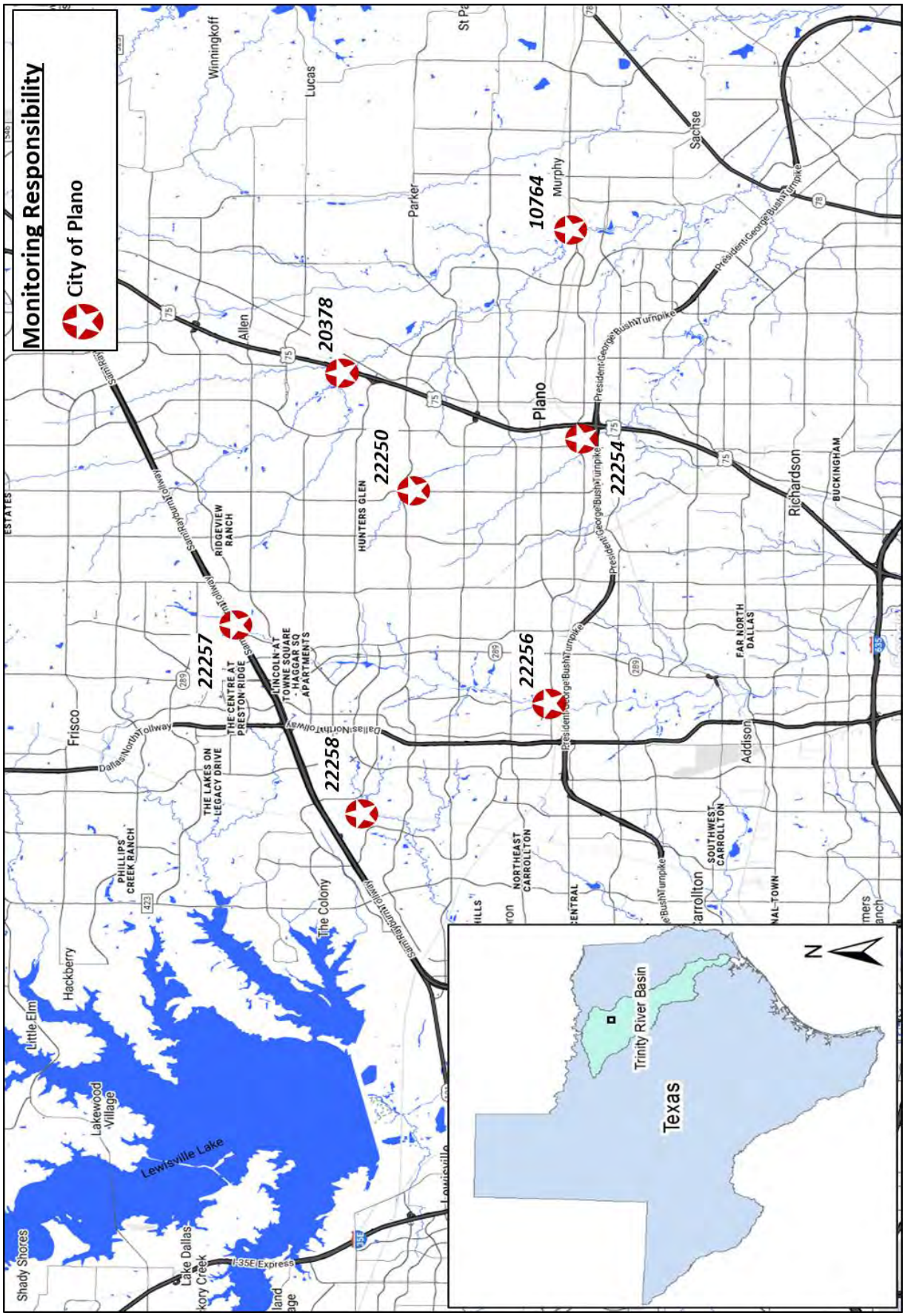
City of Grand Prairie



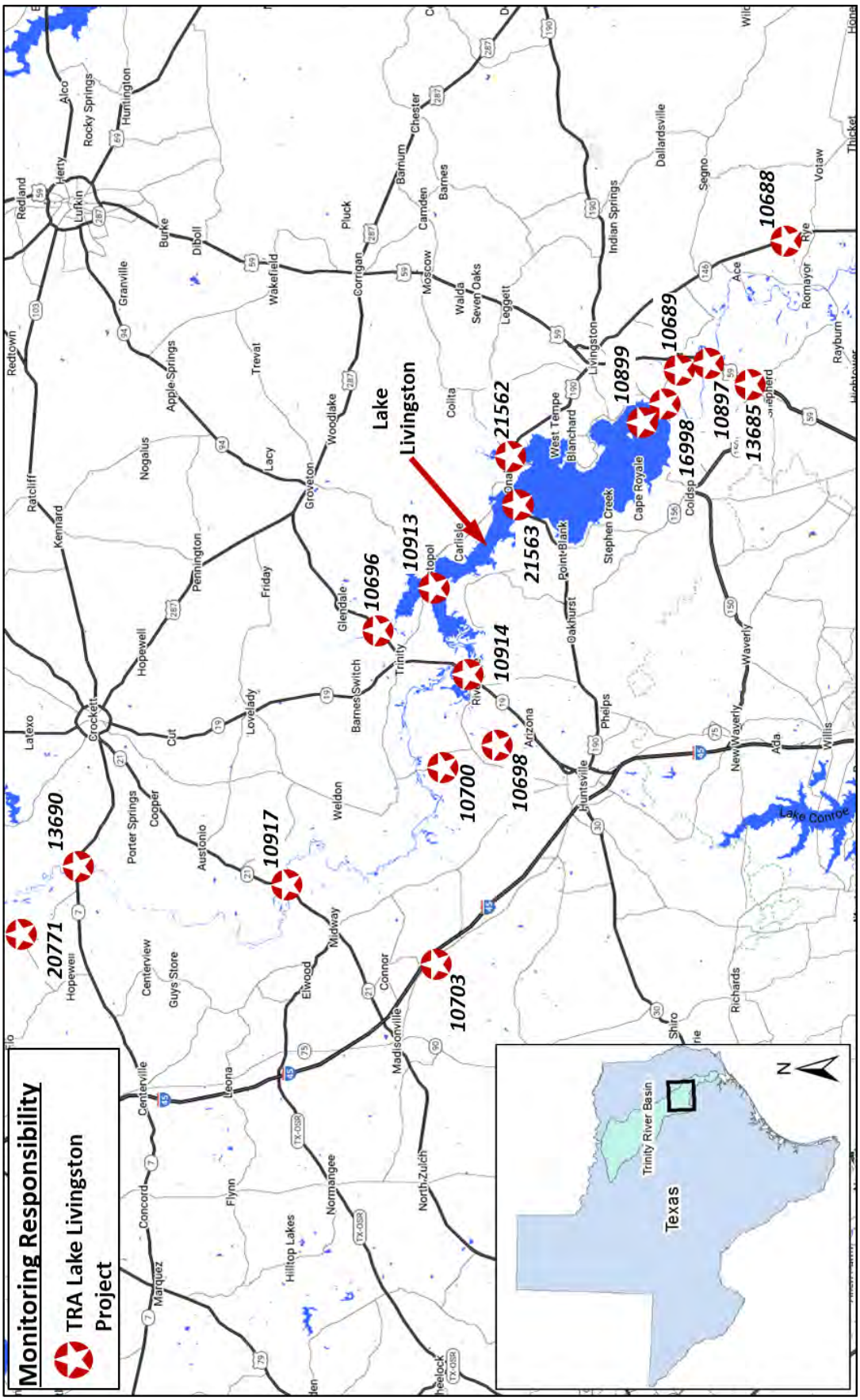
City of Irving

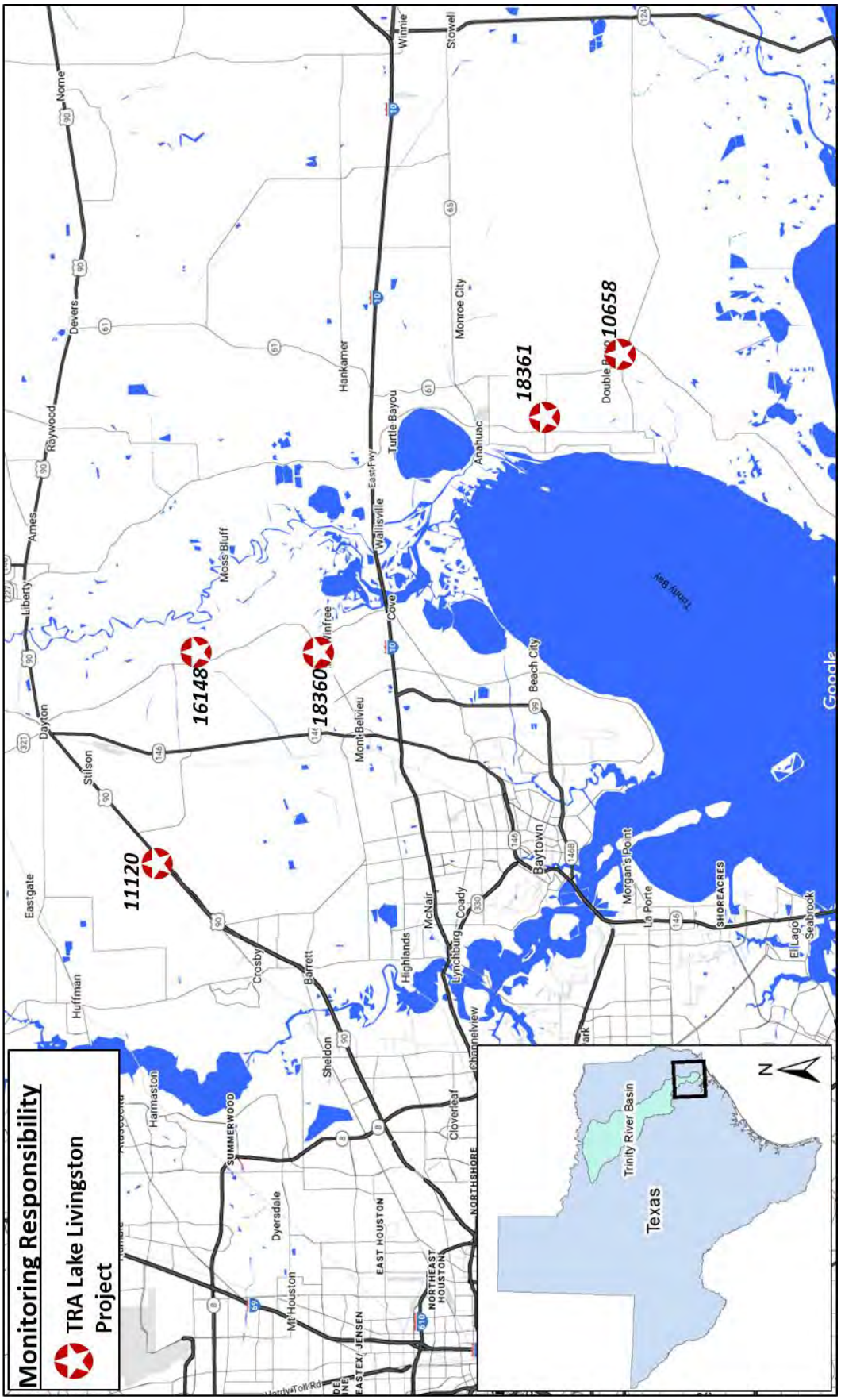


City of Plano

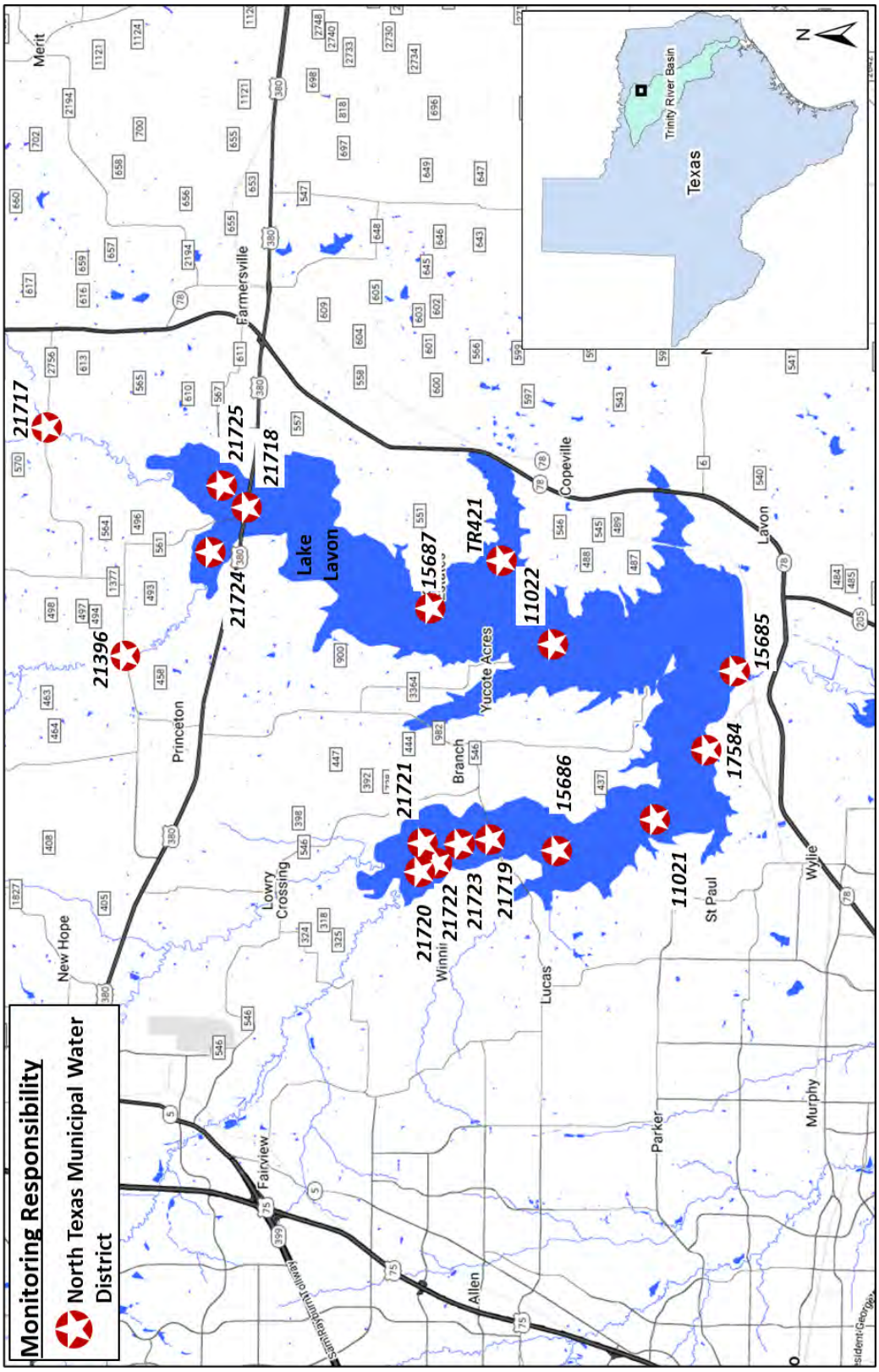


Lake Livingston Project

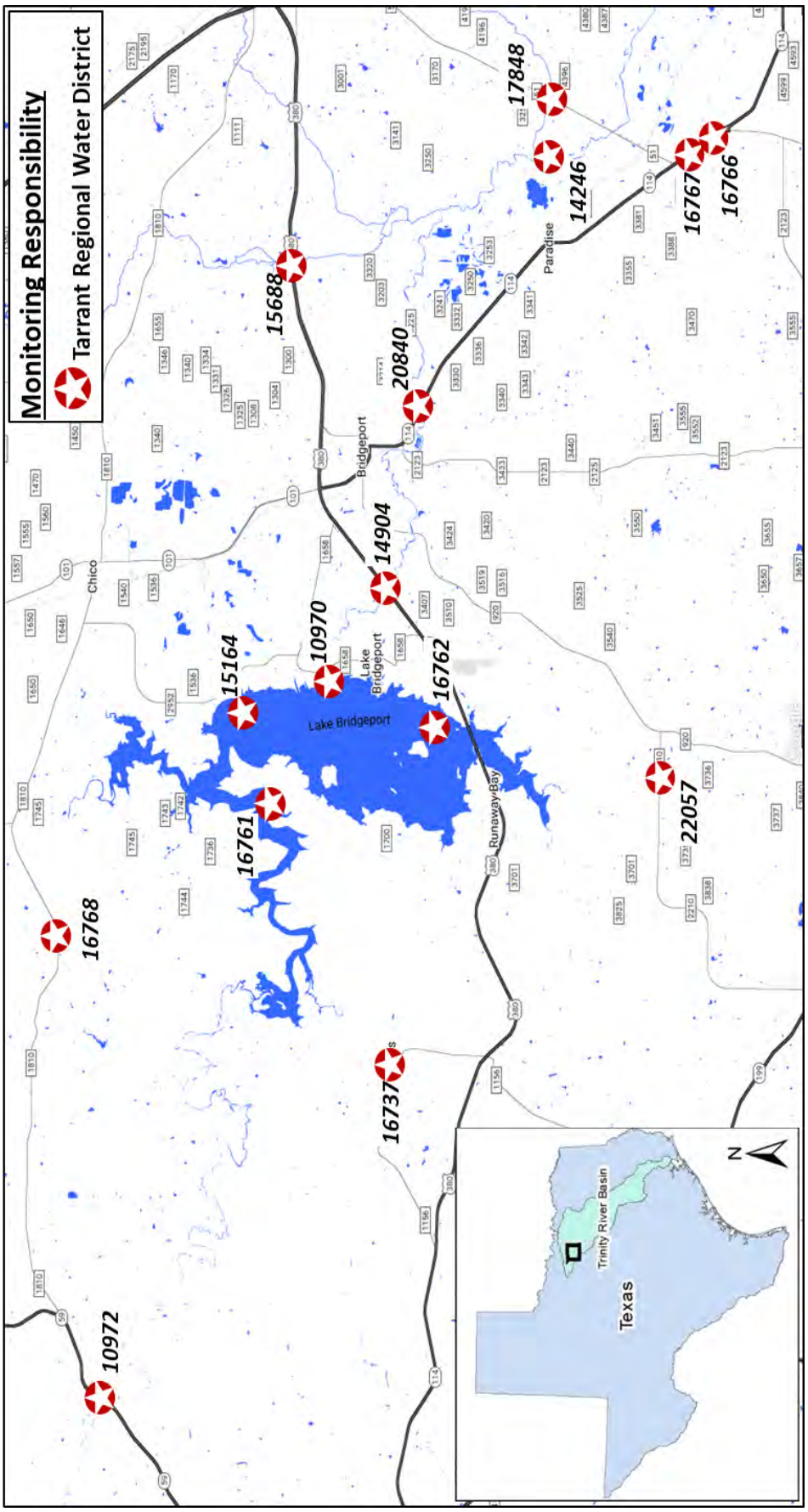



Monitoring Responsibility
TRA Lake Livingston Project
11120
16148
18360
18361
10658
Trinity River Basin
Texas
N
Google

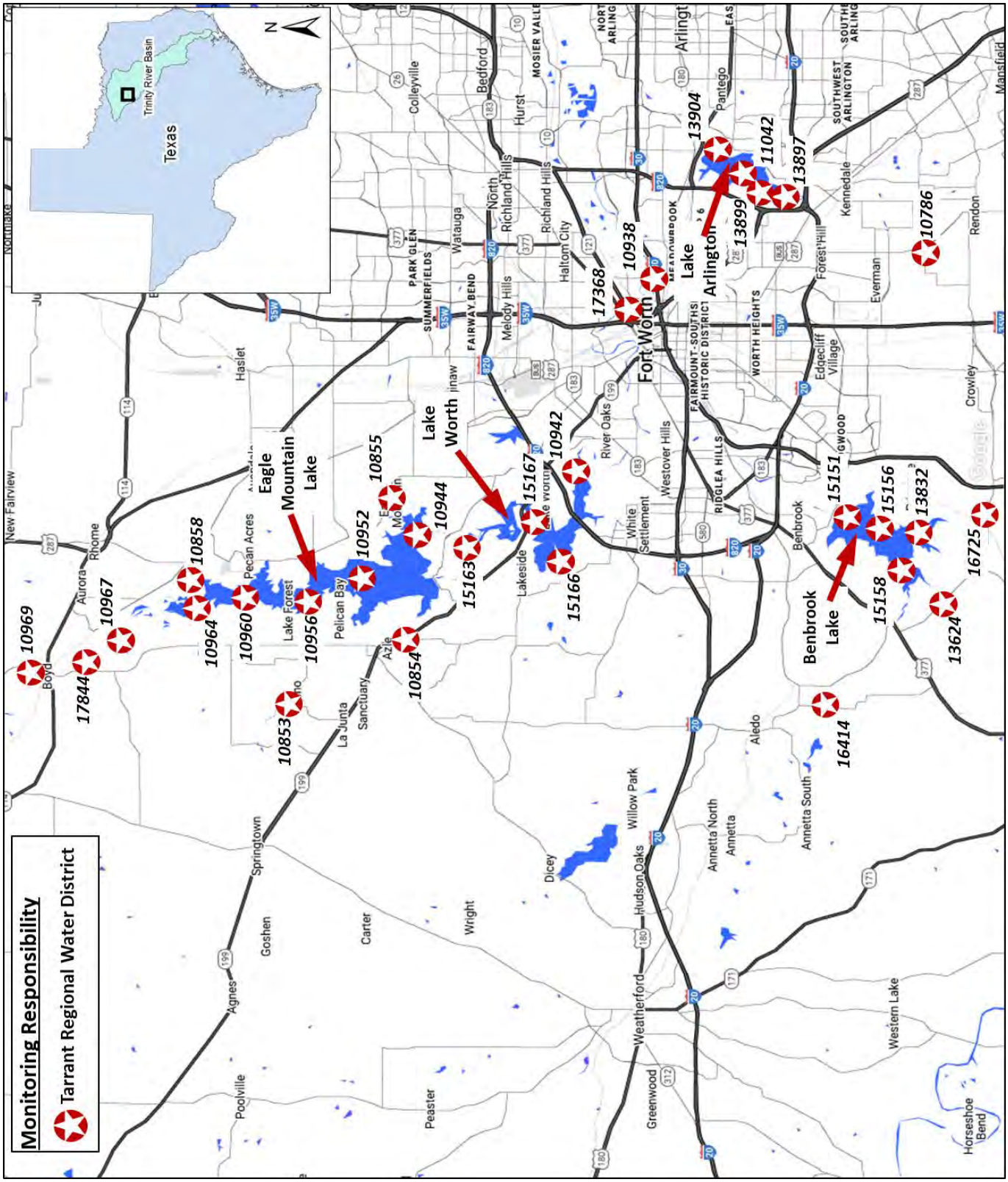
North Texas Municipal Water District

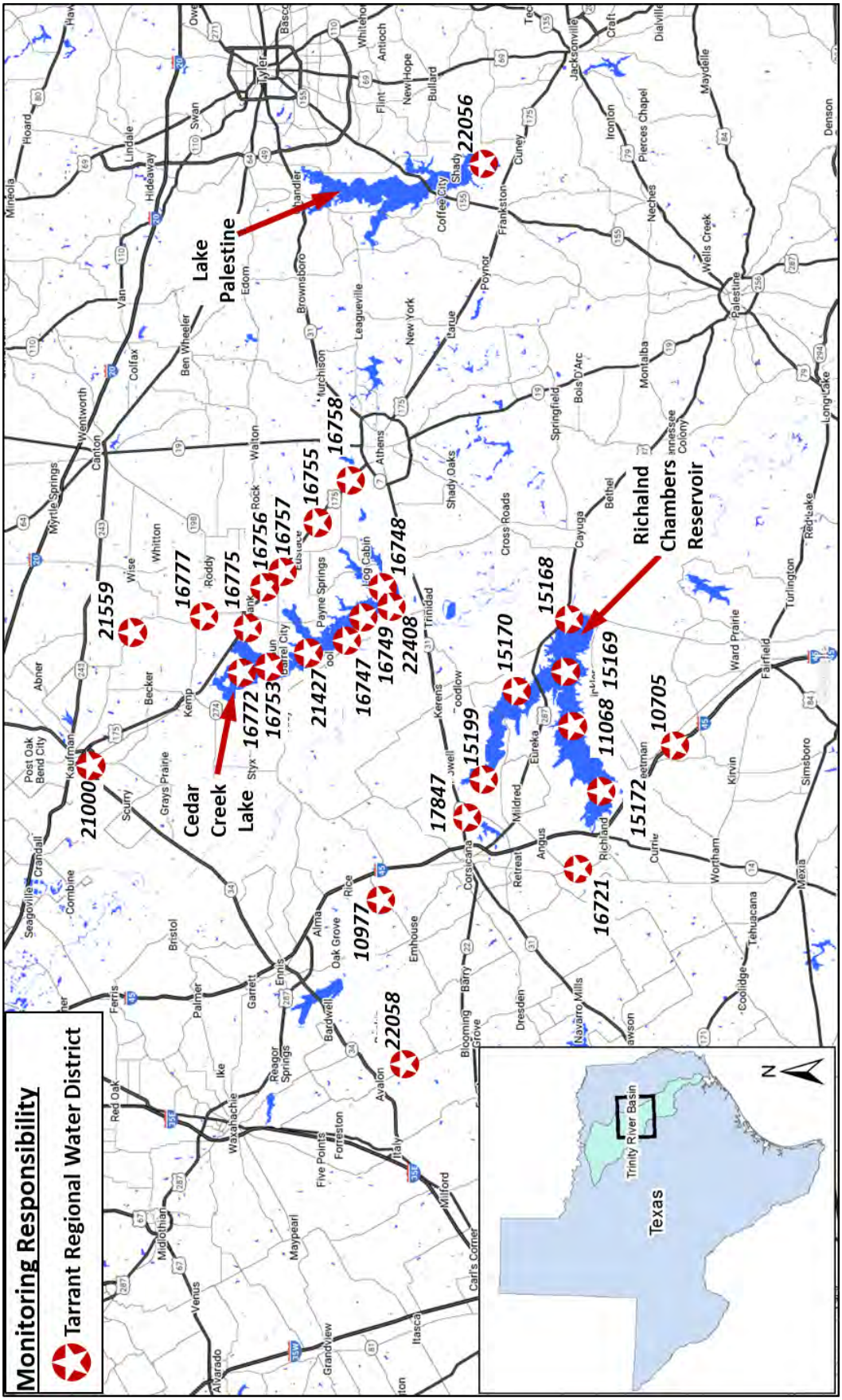


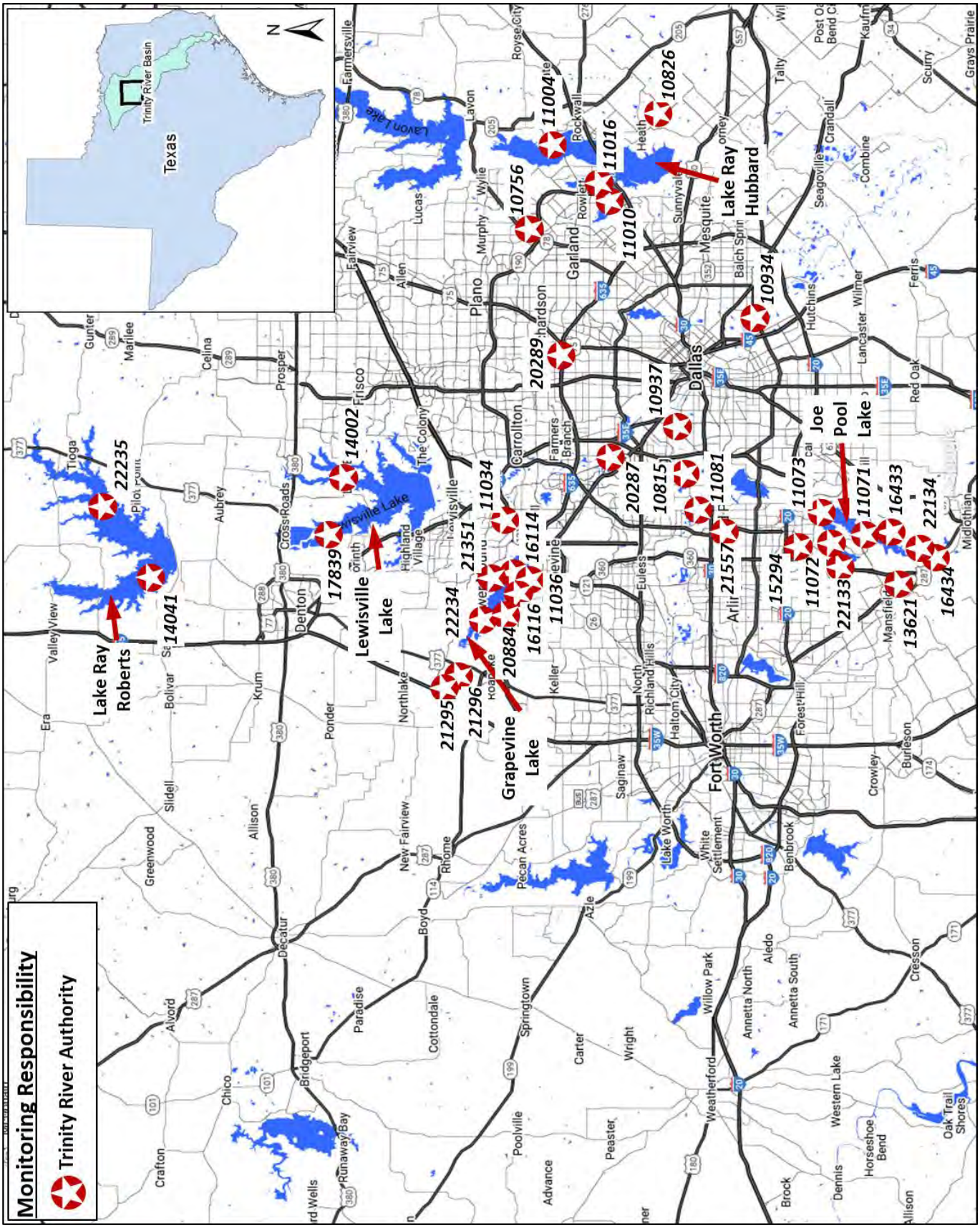
Tarrant Regional Water District

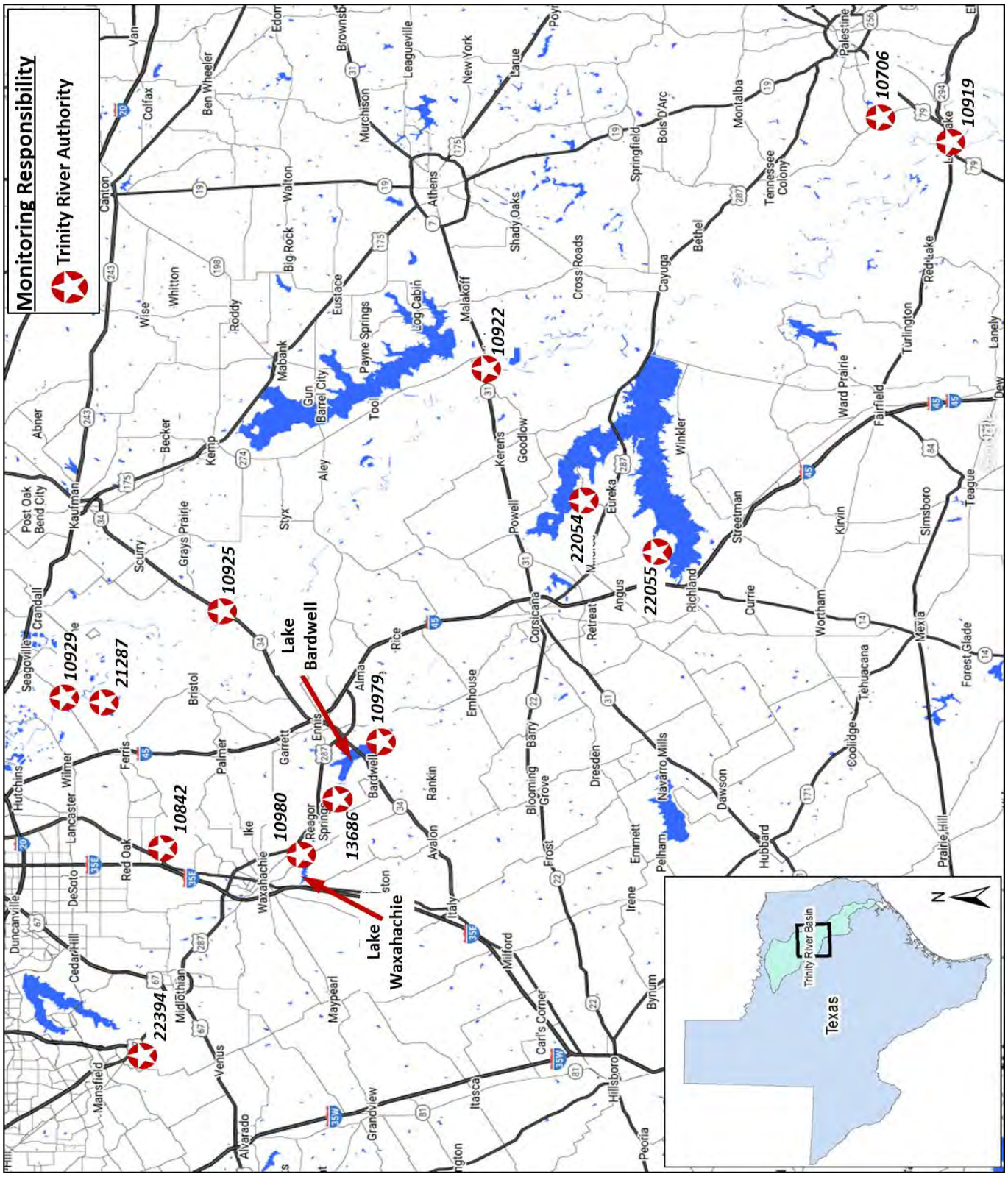


Tarrant Regional Water District (continued)

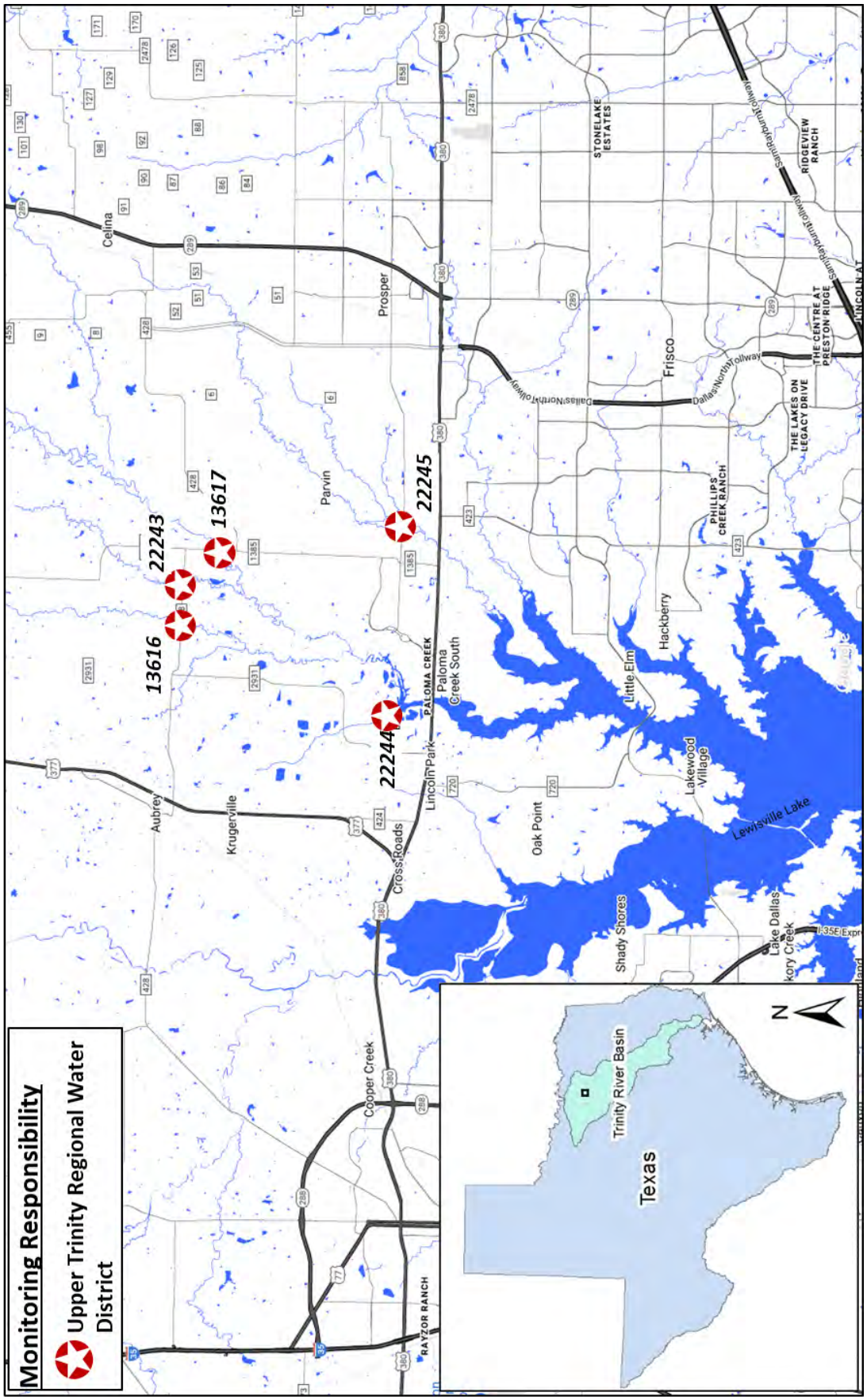



Monitoring Responsibility
Tarrant Regional Water District
Lake Palestine
Cedar Creek Lake
Richalnd Chambers Reservoir
22056
16758
16755
16757
16756
16775
16777
21559
16748
16749
22408
16747
21427
16753
16772
21000
15168
15170
15199
17847
11068
15169
10705
15172
16721
10977
22058
Trinity River Basin
Texas
N


Monitoring Responsibility
Trinity River Authority
Texas
Trinity River Basin
N
Lake Ray Roberts
14041
22235
Lewisville Lake
17839
14002
21351
11034
22234
20884
16116
16114
11036
21295
21296
Grapevine Lake
20289
10756
11004
11016
11010
10826
10934
10937
20287
10815
11081
21557
15294
11072
22133
11073
11071
16433
22134
16434
13621
Lake Ray Hubbard
Joe Pool Lake
Dallas
Fort Worth
Plano
Garland
Mesquite
Denton
Frisco
Carrollton
Farmers Branch
Irving
Arlington
Grand Prairie
Mansfield
Midlothian
Lavon Lake


Monitoring Responsibility
Trinity River Authority
10706
10919
10922
22054
22055
10925
10929
21287
Lake Bardwell
10979
10842
10980
13686
Lake Waxahachie
22394
Trinity River Basin
Texas
N

Upper Trinity Regional Water District



Appendix D: Field Data Sheets

City of Arlington Environmental Management Stream Sample Survey Form

Sample Tag _____ Location: _____
Site Number _____ Date: _____ Time: _____
TCEQ Station ID: _____ Days Since Last Rain _____
Samples Collected by: _____ Routine: Monthly Quarterly
Weather: _____ Sonde Serial Number _____

Field Data

pH _____ Water Temperature _____
Dissolved Oxygen _____ Air Temperature _____
Dissolved Oxygen Percent _____ Water Color _____
Specific Conductance _____ Sample Depth _____
Turbidity _____ Flow Estimate _____
Secchi Depth _____ Stream Width _____
Ammonia _____ Column Depth _____

Flow Severity (Circle Appropriate)

1= No Flow 2=Low 3=Normal 4=Flood 5=High 6=Dry

Observations

_____

_____

Drought Parameters (Indicate below if Flow Severity equals 1, otherwise indicate N/A)

Maximum Pool width (Meters) _____ Maximum Pool depth (Meters) _____
Pool length (Meters) _____ % Pool coverage in 500 Meter reach _____

Indicate if requested	Analysis Requested						
	Quantity	Volume	Matrix	Preservative	Filtered	Parameters	Lab
	1	500mL	Non-Potable	HNO3 (at lab) Ice in Field	Yes	Dissolved Metals: *Cd, Cr, Cu, Pb, Ni, Zn, Fe, Mn*	Arlington
	1	120mL	Non-Potable	Ice	No	*E. coli*	Arlington
	Quantity	Volume	Matrix	Preservative	Filtered	Parameters	Lab
	1	1000mL	Non-Potable	Ice	No	Chlorophyll A	CRWS
	1	1000mL	Non-Potable	Ice	No	OP, Hardness, NO2, NO3	CRWS
	1	1000mL	Non-Potable	H2SO4	No	TKN, TP	CRWS
	1	120mL	Non-Potable	Ice	No	E. coli	CRWS

Relinquished By: _____ Relinquished By: _____
Date/Time _____ Date/Time _____
Received By: _____ Received By: _____
Date/Time _____ Date/Time _____

White Copy= TRA Yellow Copy=Arlington Water Utilities Lab Pink Copy=City of Arlington Environmental

DATE:

INSTRUMENT #:

INSPECTORS INITIALS:

City of Dallas

DALLAS WATER UTILITIES
SOURCE WATER QUALITY
FIELD DATA SHEET

dallas water utilities

SITE:														
TIME														
WATER COLUMN DEPTH*														
SAMPLE DEPTH														
SPECIFIC CONDUCTIVITY														
pH														
D.O.														
TURBIDITY NTU														
WATER TEMPERATURE ℃														
AIR TEMPERATURE ℃														
SECCHI														
CONDITIONS														
LAKE/TRIBUTARY														
DAYS SINCE RAIN														
FLOW SEVERITY														
Number of People Observed														
Evidence of Primary Contact**														

*SAMPLE DEPTH: If sample is 1.5 meters (5 ft) deep or greater take 1, 2 or 3 meter increment field readings with sonde starting at sample collection at 0.3 meters. Increments are based on water column depth.

**Evidence of Primary Contact: Observed (1) or Not Observed (0). Examples: rope swings, swimming beaches, bathing suits, inflatable rafts, life jackets.

COMMENTS:

Field Data Sheet

Site ID: Sampled by:

SiteNotes:

Water Quality

Date/time: Depth (M): WQ MeterID

Weather: (1)Sunny, (2)Pt Cloudy, (3)Cloudy, (4)Lt Rain, (5)Heavy Rain, (6)T Storm _____

Samples Collected: ☐ Field Split: ☐ Field Blank: ☐ Trip Blank: ☐

Fauna:

Flora:

Water Temp (C)

Air Temp (C)

Flow (cfs)

Conductance (us/cm)

DO (MG/L)

pH

Flow Severity 1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry

Days Since Rain

Sample Site Depth (M)

Flow Method 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER

Pool Width

Pool Depth

Pool Length

% Pool Coverage

Average Time Measurements

L (ft)	W (ft)	D (ft)	t (sec)

Notes

Storm Water Clean River Project Field Work Sheet

Sampler Name:		Date:	
	TRA #: 20444 (310 Bridge)	TRA #: 20933 (Sylvan Bridge)	TRA #: 20934 Santa Fe Trl (Standing Water)
SAMPLE COLLECTION TIME			
TEMPERATURE, WATER (C)			
TEMPERATURE, AIR (C)			
TRANSPARENCY, SECCHI DISC (m)			
SPECIFIC CONDUCTANCE, (uS/cm)			
OXYGEN, DISSOLVED (mg/L)			
pH (S.U)			
DAYS SINCE PRECIPITATION EVENT (days)			
TURBIDITY (NTU)			
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	N/A - Trinity River	N/A - Trinity River	N/A - Trinity River
MAXIMUM POOL WIDTH AT TIME OF STUDY	N/A - Trinity River	N/A - Trinity River	N/A - Trinity River
MAXIMUM POOL DEPTH AT TIME OF STUDY	N/A - Trinity River	N/A - Trinity River	N/A - Trinity River
POOL LENGTH	N/A - Trinity River	N/A - Trinity River	N/A - Trinity River
% POOL COVERAGE IN 500 METER REACH	N/A - Trinity River	N/A - Trinity River	N/A - Trinity River
PRIMARY CONTACT, OBSERVED ACTIVITY			
EVIDENCE OF PRIMARY CONTACT RECREATION			
FLOW STREAM, INSTANTANEOUS (cfs)	USGIS Station #: 08057410	USGIS Station #:08057000	USGIS Station #:08057000
FLOW SEVERITY			
STREAM FLOW ESTIMATE (cfs)			
FLOW MTH			
E. COLI (MPN/100 ml)			

Notes:

City of Dallas

DWU

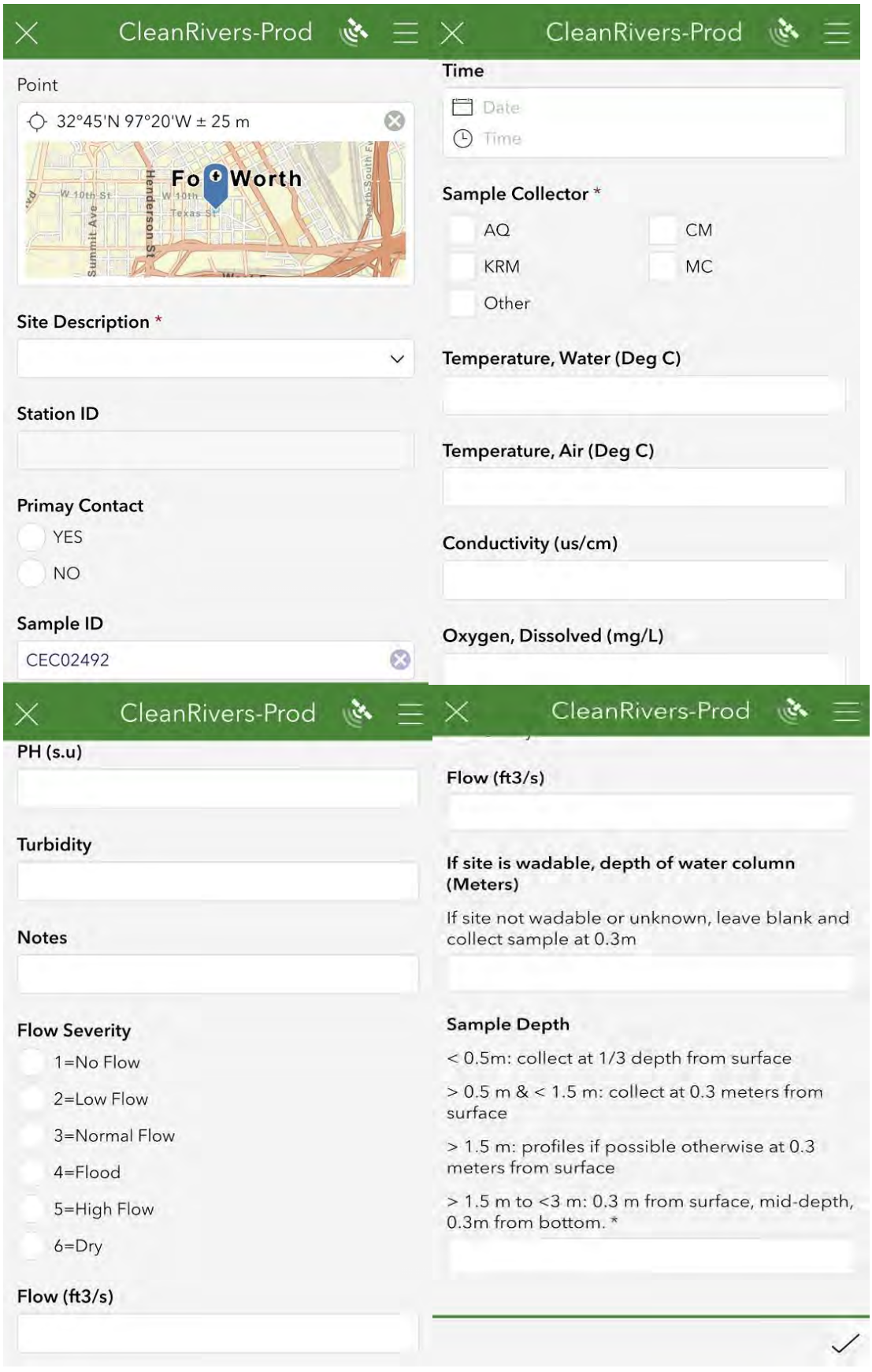
Supervisor: _____

Date: _____

QA: _____

Date: _____

Instrument #:


CleanRivers-Prod
Point
32°45'N 97°20'W ± 25 m
Site Description *
Station ID
Primay Contact
YES
NO
Sample ID
CEC02492
CleanRivers-Prod
Time
Date
Time
Sample Collector *
AQ
CM
KRM
MC
Other
Temperature, Water (Deg C)
Temperature, Air (Deg C)
Conductivity (us/cm)
Oxygen, Dissolved (mg/L)
CleanRivers-Prod
PH (s.u)
Turbidity
Notes
Flow Severity
1=No Flow
2=Low Flow
3=Normal Flow
4=Flood
5=High Flow
6=Dry
Flow (ft3/s)
CleanRivers-Prod
Flow (ft3/s)
If site is wadable, depth of water column (Meters)
If site not wadable or unknown, leave blank and collect sample at 0.3m
Sample Depth
< 0.5m: collect at 1/3 depth from surface
> 0.5 m & < 1.5 m: collect at 0.3 meters from surface
> 1.5 m: profiles if possible otherwise at 0.3 meters from surface
> 1.5 m to <3 m: 0.3 m from surface, mid-depth, 0.3m from bottom. *

LAB CONTOL NO:_____ CHAIN OF CUSTODY: YES:_____NO:_____

SITE NO.:___GP-_____

CITY OF GRAND PRAIRIE
ENVIRONMENTAL SERVICES DEPARTMENT
STREAM ANALYSIS REQUEST FORM

GRAND PRAIRIE SAMPLE NO:_____ COLLECTED BY:_____

GRAB:_____ COMPOSITE:_____ DATE COLLECTED:_____

LOCATION:_____ TIME COLLECTED:_____

MATERIAL SAMPLED:_____ TRANSPORTED BY:_____

PRESERVATIVE:_____ DATE RECEIVED:_____

CONTAINER TYPE: GLASS___ PLASTIC___ VOA___ VOLUME_____ RECEIVED BY:_____

LABORATORY PARAMETERS:

	SOLIDS TESTING		ROUTINE TESTING		METAL DISS:____ TOTAL:____
	TOTAL SUSPENDED SOLIDS		ALKALINITY phph as CaCO3		ALUMINUM
	VOLATILE SUSPENDED SOLIDS		ALKALINITY-TOTAL as CaCO3		ANTIMONY
	TOTAL DISSOLVED SOLIDS		AMMONIA NITROGEN		ARSENIC
	TOTAL SOLIDS		BICARBONATE		BARIUM
	TOTAL VOLATILE SOLIDS		CARBONATE		BERYLLIUM
	PERCENT TOTAL SOLIDS		CHEMICAL OXYGEN DEMAND		BORON
	PERCENT VOLATILE SOLIDS		CHLORIDES		CADMIUM
			CHLOROPHYLL A		CALCIUM
	BIOCHEMICAL OXYGEN DEMAND		CYANIDES		CHROMIUM
	5-DAY TOTAL		GREASE & OIL		CHROMIUM +6
	5-DAY CARBONACEOUS		FLOURIDES		COBALT
	7-DAY TOTAL		HYDROGEN SULFIDE		COPPER
	7-DAY CARBONACEOUS		HARDNESS		IRON
			INFRARED		LEAD
	BIOLOGICAL TESTING		TOTAL KJELDAHL NITROGEN		MAGNESIUM
	TOTAL COLIFORMS (FILTERED)		NITRATE NITROGEN		MANGANESE
	TOTAL COLIFORMS (MMO-MUG)		NITRITE NITROGEN		MOLYBDENUM
	E. COLIFORM		TOTAL NITROGEN		MERCURY
	FECAL COLIFORMS		PH		NICKEL
	FECAL STREPTOCOCCUS		PHENOLS		POTASSIUM
	MICROSCOPIC EXAMINATION		PHEOPHYTIN		SELENIUM
			PHOSPHORUS-ORTHO		SILICA
	GAS CHROMATOGRAPHY		PHOSPHORUS-TOTAL		SILVER
	PESTICIDE SCAN		SPECIFIC CONDUCTANCE		SODIUM
	HERBICIDE SCAN		SULFATES		THALLIUM
	PCBs		SULFIDES		TIN
	THM'S		TOTAL ORGANIC CARBON		VANADIUM
	VOC'S		TOTAL PETROLEUM HYDROCARBONS		ZINC
			GC/MS		
			TTO VOLATILE SCAN		
			BASE NEUTRALS SCAN		
			ACID EXTRACTABLE SCAN		

FIELD PARAMETERS:

DAYS SINCE LAST RAIN:_____ FLOW SEVERITY:Circle One Number (1) No Flow (2) Low Flow (3) Normal Flow (4) Flood (5) High Flow (6) Dry

Water Temp:_____ DO:_____ pH:_____ DO % Saturation:_____ Other (_____):_____

Conductivity:_____ Turbidity:_____ Ammonia:_____ Air Temperature:_____ Secchi Disk Depth:_____

LEGACY FIELD PARAMETERS (indicate with an X):

STREAM STAGE:_____ WEATHER: Total Cloud Cover_____Cloudy but Broken_____Cloudy Sunny_____Clear_____

WATER COLOR: Clear___ Light Brown___ Medium Brown___ Dark Brown___ Milky___ Light Green___ Dark Green___ Other___

VELOCITY: None_____Sluggish_____Moderate_____Rapid_____

TRA TEST PARAMETERS: Monthly_____Quarterly_____Annual_____

FIELD OBSERVATIONS:_____

SPECIAL TESTING:_____ LABORATORY OFFICIAL:_____

**SEE ATTACHMENT FOR ANALYTICAL RESULTS DATE REPORTED:_____

GP-ESR-0001 REV 05/19

IRVING
TEXAS

S –

Lab No. _____

Sample Data Sheet – Stormwater

Sampler No.: _____ Sampler: _____

Location: _____ No. of Containers: _____

Source: ❑ Stream ❑ Storm Event ❑ CRP ❑ Other: _____

Date Collected: _____ / _____ / _____ Time: _____ ❑ a.m. ❑ p.m.

Type of Samples: ❑ Grab ❑ Composite ❑ Manual ❑ Auto

Container(s): ❑ Cubitainer ❑ Bacti Bottle ❑ Glass Jar ❑ Other: _____

Preservative(s): ❑ Ice ❑ H2SO4 ❑ HNO3 ❑ Other: _____

Sample Depth: _____ Days Since Last Rainfall: _____ / _____ in.

Flow Severity: ❑ No Flow ❑ Low ❑ Normal ❑ Flood ❑ High ❑ Dry

Observations: _____

_____

_____

Parameter	Parameter	Parameter	Parameter
❑ BOD	❑ TKN	❑ As, Total	❑ As, Diss
❑ COD	❑ TDS	❑ Cd, Total	❑ Cd, Diss
❑ Hardness	❑ TSS	❑ Cu, Total	❑ Cu, Diss
❑ Nitrogen, Ammonia	❑ TOC	❑ Cr, Total	❑ Cr, Diss
❑ Nitrite	❑ TPH	❑ Pb, Total	❑ Pb, Diss
❑ Nitrate	❑ BTEX	❑ Ni, Total	❑ Ni, Diss
❑ Nitrate + Nitrite-N	❑ E. Coli	❑ Zn, Total	❑ Zn, Diss
❑ Chlorophyll A	❑ Fecal Strep	❑ Other _____	
❑ Phos (T)	❑ Atrazine	❑ Other _____	
❑ Phos (O)	❑ Oil and Grease	❑ Other _____	

Field Parameters

DO: _____ mg/L DO%: _____ pH: _____ SpC: _____ Tair: _____ Twater: _____

Chain of Custoday

I certify this sample was collected by me at the time and date shown and remained in my custody until transferred to the undersigned.

_____ _____ _____ ❑ a.m. ❑ p.m.
Sampler Signature Date Time

_____ _____ _____ ❑ a.m. ❑ p.m.
Received by Signature Date Time

Form # 32055
Rev. 8/22

TRINITY RIVER AUTHORITY - LAKE LIVINGSTON PROJECT

SS
Field ID Number

P. O. Box 360, Livingston, Tx 77351 ph 936 365 2292

FIELD DATA SHEET

Program or Project Name: _____

Date:

Station ID Number: _____ Collected By: _____ Time: _____

Station Description: _____

Flow(cfs): _____

Air Temperature(C): _____ Days Since Last Rain: < 1 > 7 Other ____ Inches: _____

Evidence of Primary Contact Rec (0=Not Observed, 1=Observed):_____ # of People Observed: _____

Observations (weather, water appearance, etc.): _____

Analyses to be Conducted - see reverse

Stream Sample Routine	
Dissolved Metals	
Total Metals	
Field Parameters only	
Special Study	
Other	
TKN Analysis	

(Sample submitted to TRA CRWS lab)

Flow Severity:_____

1=No Flow, 2=Low, 3=Normal, 4=Flood, 5=High, 6=Dry

Secchi Disc: _____ meters

YSI Multi - Probe Calibration

S.N. of Sonde used: _____

FIELD PARAMETERS

Sample Depth	Water Temp.	D.O.	pH	Conductivity

Containers Collected

Container/ Parameter Group Code	Quantity	Volume mL	Presevation and Parameter Group
A	_____	1000 or _____	H2SO4 (NH3, TPO4, Hard, TKN)
B	_____	1000 or _____	Filtered (NO2, NO3, Cl, SO4, OPO4, TDS
C,D	_____	1000 or _____	Plain (Alk, TSS)
E	_____	100 or _____	Bacteriological (E. coli)
F	_____	1000 or _____	Amber Glass (Chlorophyll)
G	_____	1000 or _____	HNO3 (Se)
H	_____	500 or _____	HNO3 Filtered (Fe, Ni, Mn, Zn, Al Cr, Cd, Pb, Cu, Ag, As)
_____	_____		other

Field Preservation Unique Chem # _____

Matrix = Water Containers are plastic except as noted

Temp. of samples upon receipt _____ degrees C

OK? Y N In transit on ice? Y N

Relinquished By:_____ Date/Time: _____

Received By:_____ Date/Time: _____

Relinquished By:_____ Date/Time: _____

Received By:_____ Date/Time: _____

Comments:

For stream sites that are not wadeable, no total water column depth is reported and the sample depth is defaulted to 0.3 m.

For wadeable streams total water column depth is derived from the flow measurement form.

For lake sites, total water column depth is obtained from the profile data for that particular site.

North Texas Municipal Water District
Stream
CRP Field Data Reporting Form

Date:		Station Location:				TCEQ Site ID:	
Time:		Basin/Segment:		Technicians (Print/Sign):			
County:		Monitoring Type:					
NM Laboratory ID #:				Stream Width (ft):		Section Width (ft):	
Chain of Custody #:				Time Start:		Time End:	

Parameter Code	Parameter		Sample Depth (m)	Temp. (°C) 00010	pH (s.u.) 00400	D.O (mg/L) 00300	Conductivity (uS/cm) 00094
01351		Flow Severity 1- No Flow 2-Low Flow 3 - Normal 4 - Flood 5 - High 6 - Dry					
00061		Flow (CFS)					
74069		Flow Estimate					
89835		Flow Measurement Method 1 - Gauge 2 - Electronic 3 - Mechanical 4 - Weir/Flume 5 - Doppler					
20424		Water Clarity 1 - Excellent 2 - Good 3 - Fair4 - Poor 5 - Other*					
89969		Water Color 1 - Brown 2 - Reddish 3 - Green 4 - Black 5 - Clear 6 - Other*					
89971		Water Odor 1 - Sewage 2 - Oily/Chem 3 - Rotten Egg 4 - Musky 5 - Fishy 6 - None 7 - Other*					
00020		Air Temperature (º Celsius)					
89966		Weather 1 - Clear 2 - Partly Cloudy 3 - Cloudy 4 - Rain 5 - Other*					
89965		Wind Direction: 1 - Calm 2 - Slight 3 - Moderate 4 - Strong					
72053		Significant Precipitation (Days)					
00078		Transparency, Secchi Disk (m)					
-		Total Depth (m)					

Comments and details/description for parameter codes marked other*:	Tech Taking Flow:	Total Flow (CFS)

Measurement Comments and Field Observations		
Biological Activities:		
Aquatic Vegetation:		
Terrestrial Vegetation:		
Aquatic Animals:		
Terrestrial Animals:		
Aquatic Insects:		
Terrestrial Insects:		
Left Bank:		
Right Bank:		
Watershed Activities:		
Water Quality/ Stream Use:		
Specific Sample Info:		
Missing Parameters:		
Notes:		
Drought Parameters (if applicable)	Parameter Code	Result
Maximum Pool Width (m)	89864	
Maximum Pool Depth (m)	89865	
Pool Length (m)	89869	
% Pool Coverage in a 500 m Reach	89870	
Drought Conditions:		
Sonde Depth in Air (m):		

Date:		Station Location:		TCEQ Site ID:	
Final Review					

North Texas Municipal Water District
Reservoir
CRP Field Data Reporting Form

Date:		Station Location:			TCEQ Site ID:		
Time:		Basin/Segment:		Technicians (Print/Sign):			
County:		Monitoring Type:					
NM Laboratory ID #:			Total Depth (m):		Total Measurements:		
Chain of Custody #:			Time Start:		Time End:		

Parameter Code	Parameter		Sample Depth (m)	Temp. (°C)	pH (s.u.)	D.O (mg/L)	Conductivity (uS/cm)
20424		Water Clarity 1 - Excellent 2 - Good 3 - Fair 4 - Poor 5 - Other*					
89969		Water Color 1 - Brown 2 - Reddish 3 - Green 4 - Black 5 - Clear 6 - Other*					
89971		Water Odor 1 - Sewage 2 - Oily/Chem 3 - Rotten Egg 4 - Musky 5 - Fishy 6 - None 7 - Other*					
00020		Air Temperature (° Celsius)					
89966		Weather 1 - Clear 2 - Partly Cloudy 3 - Cloudy 4 - Rain 5 - Other*					
89965		Wind Direction: 1 - Calm 2 - Slight 3 - Moderate 4 - Strong					
72053		Significant Precipitation (Days)					
00078		Transparency, Secchi Disk (m)					
00051		Reservoir Access Not Possible					
00052		Reservoir Stage (TWDB Website)					
00053		Reservoir Percent Full (TWDB Website					
00054		Reservoir Storage (TWDB Website)					
82903		Depth of Bottom of Water Body (m)					
89978	NA	Primary Contact Observed Act # of people observed 0-10 >10					
89979	NA	Evidence of Primary Contact Rec 1 - Observed 0 - Not observed					
89968		Water Surface 1-Calm 2-Ripple 3-Wave 4-Whitecap					

Comments and details/description for parameter codes marked other*:

Measurement Comments and Field Observations	
Biological Activities:	
Aquatic Vegetation:	
Terrestrial Vegetation:	
Aquatic Animals:	
Terrestrial Animals:	
Aquatic Insects:	
Terrestrial Insects:	
Watershed Activities:	
Water Quality/ Stream Use:	
Specific Sample Info:	
Missing Parameters:	
Notes:	
Drought Conditions:	
Sonde Depth in Air (m):	

Date:		Station Location:		TCEQ Site ID:	
Final Review					

TARRANT REGIONAL WATER DISTRICT
Reservoir Data Sheet

Reservoir: Wind:

Collected By: Cloud Cover: %

Days Since Last Measurable Rainfall:

Comments:

DATE	TIME (military)	SITE NAME	SITE ID	SECCHI (inches)	SECCHI (meters)	TOTAL DEPTH (m)	TOTAL DEPTH (ft)

All Observations At 1.0 M Intervals

DEPTH (m)	TEMP (°C)	pH (units)	DO mg/L	SPC (umhos/cm)

PHOTOMETER

DEPTH (ft)	VALUE
deck	
surface	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

DUPLICATE COLLECTED

Site

Depth

West Fork E. Coli

Sample Date: Sampler: BP Release(cfs): DSLR: Rain(inches):

SITE LOCATION	SITE ID	Flow cfs	Flow Severity	TIME	Temp °C	pH units	DO mg/L	Cond µs/cm	Turbidity NTU	Contact Recreation	Number People Observed	Sample ID
W. Fork Trinity@ Van Meter Bridge	10967											
W. Fork Trinity@ Bobo Bridge	17844											
W. Fork Trinity @ FM 730	10969											
Salt Creek @ SH 114	16766											
Garrett Creek @ SH 114	16767											
Martin Branch @ SH 51	17848											
W. Fork Trinity @ FM 3390	14246											
Big Sandy Creek @ SH 380	15688											
W. Fork Trinity @ SH 380	14904											
W. Fork Trinity @ SH 114 BP	20840											
Replicate												

Primary Contact Recreation: 0-not observed 1-observed

Flow Severity: 1-no flow 2-low 3-normal 4-flood 5-high 6-dry

Comments:

P:/NES/WQ/SAMPLING FORMS/E.coli.xls

TARRANT REGIONAL WATER DISTRICT
TRIBUTARY PROFILE
EAGLE MOUNTAIN/WEST FORK TRIBUTARIES/RAIN GAGE

DATE:_____ DAYS SINCE LAST RAINFALL (DSLR) _____ RAINFALL (inches) _____ SAMPLER: _____

TRIBUTARY	TCEQ SITE ID #	BASE TAPE DOWN (TD)	STAFF or WIRE GAGE	TAPE DOWN (TD)	FLOW (cfs)	FLOW SEVERITY	TIME hhmm	TEMP °C	pH (su)	DO (mg/L)	COND (µs/cm)	Turbidity NTU	Primary Contact Recreation	# of People Observed	SAMPLE ID #
Ash Creek @ HWY 199 FW MAPSCO 29K	10854	23.67'	0.5'												
Walnut Creek @ FM 1542 FW MAPSCO 29K	10853	29.04'	30.47'												
W. Fork Trinity River @ FM 730 near Boyd Wise Cty MAPSCO 24 USGS (08044500)	10969	25.58'	NA												
Derrett Creek @ Central Ave. (Newark) Wise Cty MAPSCO 25	10858	19.81'	NA												
Dosier Creek @ FM 1220 FW MAPSCO 32E	10855	10.6'	0.0'												
Rain Collector EM Office		NA	NA	NA	NA	NA									

DSLR: Days since last rainfall. Range is from <1 (raining at sample) to > 75.

FLOW SEVERITY: 1-no flow 2-low 3-normal 4-flood 5-high 6-dry

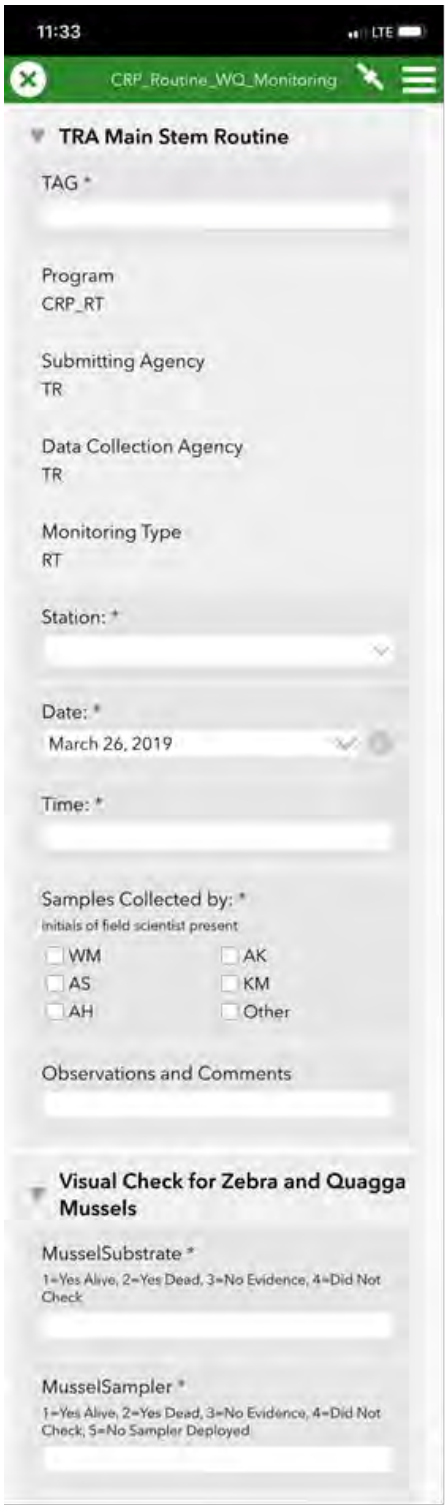
PRIMARY CONTACT RECREATION 0-not observed 1-observed

COMMENTS:_____

_____

REVISED 07/15

F:\WES\WQ\SAMPLING FORMS\TRIBS\EAGLE MOUNTAIN_WEST FORK.xls


11:33
LTE
CRP_Routine_WQ_Monitoring
TRA Main Stem Routine
TAG *
Program
CRP_RT
Submitting Agency
TR
Data Collection Agency
TR
Monitoring Type
RT
Station: *
Date: *
March 26, 2019
Time: *
Samples Collected by: *
initials of field scientist present
WM
AK
AS
KM
AH
Other
Observations and Comments
Visual Check for Zebra and Quagga Mussels
MusselSubstrate *
1=Yes Alive, 2=Yes Dead, 3=No Evidence, 4=Did Not Check
MusselSampler *
1=Yes Alive, 2=Yes Dead, 3=No Evidence, 4=Did Not Check, 5=No Sampler Deployed


11:33
LTE
CRP_Routine_WQ_Monitoring
Drought Parameters
Leave answer blank if no answer applies
Max Pool Width
(Meters)
Max Pool Depth
(Meters)
Pool Length
(Meters)
% Pool Coverage in 500 Meter Reach
(Percent)
Field Parameters
If site is wadeable, depth of water column:
(Meters)
Sample Depth *
<0.5 m: collect at 1/3 depth from surface >0.5 m & <1.5 m: collect at 0.3 meters from surface >1.5 m: profiles if possible otherwise at 0.3 meters from surface >1.5 m to <3 m: 0.3 m from surface, mid-depth, 0.3 m from bottom
Air Temp. *
(Celsius)
Days Since Last Precipitation
If Precipitation has occurred at the site within 24 hours or during sampling event use 0 for value
Turbidity
(NTU)


11:33
LTE
CRP_Routine_WQ_Monitoring
Secchi Depth
Average depth where disk appears and dissapears from view (Meters) 0.61 for any value greater than 0.60 & 1.21 for lake values greater than 1.2
Sonde Parameters
Water Temp. *
(Celsius)
Chlor. *
(RFU)
BGA *
(RFU)
SP Cond. *
(uS/cm)
DO *
(mg/L)
PH *
(SU)
Flow Parameters
Flow
(CFS)
Flow Severity
1-No Flow, 2-Low Flow, 3-Normal Flow, 4-Flood, 5-High, 6-Dry
Flow Method
1-USGS Gage, 2-Electric Meter, 3-Mechanical, 4-Weir/Flu, 5-Doppler Meter
Data Concerns
select yes if you have any concerns with the data collected I.E.(failed post calibration, field equipment failure) Record concern in observations note field
Yes
No

UPPER TRINITY REGIONAL WATER DISTRICT

CHAIN OF CUSTODY RECORD
FIELD DATA SHEET

CRP

LIMS # (TRA Lab No.)_____
LIMS Text ID (TRA Lab ID)_____

Lat: Long: **Date:**

Tag No:

Station: _____ Time: _____
Sample(s) Collected By:_____
Secchi Depth (m): Appears_____ Disappears_____ Avg _____
Air Temperature(^{0}C):_____ Days Since Last Rain:_____ Flow(cfs):_____
Method: 1=Gage 2=Electric 5=Doppler

Drought Parameters
Depth at Sample Site (m):_____ Max Pool Width (m):_____ Max Pool Depth (m):_____
Pool Length (m):_____ % Pool Coverage in 500 Meter Reach:_____

Observations (weather, obvious signs of eutrophication, etc.): _____

Analyses to be Conducted	**Samples Collected**					
	quantity	**volume**	**Matrix**	**preservative**	**filtered**	**Parameters**

FIELD PARAMETERS

Flow severity: _____

If site is wadeable, depth of water column (m): _____

<0.5 m: collect at 1/3 depth from surface
>0.5 m & <1.5 m: collect at 0.3 meters from surface
>1.5 m: profiles if possible otherwise at 0.3 meters from surface
>1.5 m to <3 m: 0.3 m from surface, mid-depth, 0.3 m from bottom

Corrections must be made with a single strike-thru and initialed. No writeovers, scratchouts, or whiteout.

Sample Depth	Water Temp (^{0}C)	pH (SU)	Sp Cond uS/cm	DO mg/L
Calibration Acceptable				

Relinquished By: _____
Date/Time: _____
Received By: _____
Date/Time: _____

Relinquished By: _____
Date/Time: _____
Received By: _____
Date/Time: _____

Copy before delivering original to lab; sheet must be signed prior to submittal of samples.

Customer: Upper Trinity Regional Water District

Attention: Angela Kilpatrick
Trinity River Authority Clean Rivers Program
5300 South Collins, Arlington, TX 76018

Michelle Carte
UTRWD QA Officer
900 N Kealy, Lewisville, TX 75057

City of Plano

CITY OF PLANO CLEAN RIVERS PROGRAM FIELD DATA SHEET

Date:____________________

Sample(s) Collected By:____

Station:_________________________________ Time:__________ *E. coli* Tag #___________

Air Temp(^{0}C):_______ Days Since Last Rain:______ Flow(cfs):_______ Secchi Depth (m):______

Flow severity: ______ If site is wadable, depth of water column (m):_______ Flow method: 1=Gage 2=Electric

Drought Parameters (If pooled)

Depth at Sample Site (m):_______ Max Pool Width (m):_______ Max Pool Depth (m):________

Pool Length (m):__________ % Pool Coverage in 500 Meter Reach:__________

Sample Depth	Water Temp (^{0}C)	pH (SU)	Sp Cond uS/cm	DO mg/L	<0.5 m: collect at 1/3 depth from surface >0.5 m & <1.5 m: collect at 0.3 meters from surface >1.5 m: profiles if possible otherwise at 0.3 meters from surface >1.5 m to <3 m: 0.3 m from surface, mid-depth, 0.3 m from bottom Corrections must be made with a single strike-thru and initialed. No write-overs, scratchouts, or whiteout.
Calibration Acceptable					

Observations:

____

____

Station:_________________________________ Time:__________ *E. coli* Tag #___________

Air Temp(^{0}C):______ Days Since Last Rain:______ Flow(cfs):_______ Secchi Depth (m):_______

Flow severity: ______ If site is wadable, depth of water column (m):_______ Flow method: 1=Gage 2=Electric

Drought Parameters (If pooled)

Depth at Sample Site (m):_______ Max Pool Width (m):_______ Max Pool Depth (m):________

Pool Length (m):__________ % Pool Coverage in 500 Meter Reach:__________

Sample Depth	Water Temp (^{0}C)	pH (SU)	Sp Cond uS/cm	DO mg/L	<0.5 m: collect at 1/3 depth from surface >0.5 m & <1.5 m: collect at 0.3 meters from surface >1.5 m: profiles if possible otherwise at 0.3 meters from surface >1.5 m to <3 m: 0.3 m from surface, mid-depth, 0.3 m from bottom Corrections must be made with a single strike-thru and initialed. No write-overs, scratchouts, or whiteout.
Calibration Acceptable					

Observations:

____

____

Station:_________________________________ Time:__________ *E. coli* Tag #___________

Air Temp(^{0}C):______ Days Since Last Rain:______ Flow(cfs):_______ Secchi Depth (m):_______

Flow severity: ______ If site is wadable, depth of water column (m):_______ Flow method: 1=Gage 2=Electric

Drought Parameters (If pooled)

Depth at Sample Site (m):_______ Max Pool Width (m):_______ Max Pool Depth (m):________

Pool Length (m):__________ % Pool Coverage in 500 Meter Reach:__________

Sample Depth	Water Temp (^{0}C)	pH (SU)	Sp Cond uS/cm	DO mg/L	<0.5 m: collect at 1/3 depth from surface >0.5 m & <1.5 m: collect at 0.3 meters from surface >1.5 m: profiles if possible otherwise at 0.3 meters from surface >1.5 m to <3 m: 0.3 m from surface, mid-depth, 0.3 m from bottom Corrections must be made with a single strike-thru and initialed. No write-overs, scratchouts, or whiteout.
Calibration Acceptable					

Observations:

____

____

____

STREAM ASSESSMENT WORKSHEET

CITY OF FRISCO TEXAS

Location/Address		Watershed	
Date		Sub-basin	
Time		Inspector	
Days Since Rain			
Weather	☐ Sunny ☐ Pt Cloudy ☐ Cloudy ☐ Lt Rain ☐ Heavy Rain ☐ T Storm		
WATER QUALITY		**Acceptable Range**	**Action Needed**
Turbidity			
Dissolved O_2 (ppm)		**>3.0**	**<2.0**
Conductivity (µs/cm)		**<1500**	**>2000**
Salinity (ppt)		**<1.5**	**n/a**
H_2O Temp °C		**≤ Air T or 37**	**> Air T or 37**
pH		**6.5 - 9**	**<6 or >10**
Air Temp °C		**N/A**	**N/A**
MORPHOLOGY			
Average Depth (ft)			
Flow Severity	☐ 1 - No flow ☐ 2 - Low Flow ☐ 3 - Normal Flow ☐ 4 - Flood ☐ 5 - High Flow ☐ 6 - Dry		CFS_____
NOTES			

Appendix E: Chain of Custody Forms

City of Arlington Environmental Management Stream Sample Survey Form

Sample Tag _____ Location: _____
Site Number _____ Date: _____ Time: _____
TCEQ Station ID: _____ Days Since Last Rain _____
Samples Collected by: _____ Routine: Monthly Quarterly
Weather: _____ Sonde Serial Number _____

Field Data

pH _____ Water Temperature _____
Dissolved Oxygen _____ Air Temperature _____
Dissolved Oxygen Percent _____ Water Color _____
Specific Conductance _____ Sample Depth _____
Turbidity _____ Flow Estimate _____
Secchi Depth _____ Stream Width _____
Ammonia _____ Column Depth _____

Flow Severity (Circle Appropriate)

1= No Flow 2=Low 3=Normal 4=Flood 5=High 6=Dry

Observations

_____

_____

Drought Parameters (Indicate below if Flow Severity equals 1, otherwise indicate N/A)

Maximum Pool width (Meters) _____ Maximum Pool depth (Meters) _____
Pool length (Meters) _____ % Pool coverage in 500 Meter reach _____

Indicate if requested	Analysis Requested						
	Quantity	Volume	Matrix	Preservative	Filtered	Parameters	Lab
	1	500mL	Non-Potable	HNO3 (at lab) Ice in Field	Yes	Dissolved Metals: *Cd, Cr, Cu, Pb, Ni, Zn, Fe, Mn*	Arlington
	1	120mL	Non-Potable	Ice	No	*E. coli*	Arlington
	Quantity	Volume	Matrix	Preservative	Filtered	Parameters	Lab
	1	1000mL	Non-Potable	Ice	No	Chlorophyll A	CRWS
	1	1000mL	Non-Potable	Ice	No	OP, Hardness, NO2, NO3	CRWS
	1	1000mL	Non-Potable	H2SO4	No	TKN, TP	CRWS
	1	120mL	Non-Potable	Ice	No	E. coli	CRWS

Relinquished By: _____ Relinquished By: _____
Date/Time _____ Date/Time _____
Received By: _____ Received By: _____
Date/Time _____ Date/Time _____

White Copy= TRA Yellow Copy=Arlington Water Utilities Lab Pink Copy=City of Arlington Environmental

City of Dallas (Collecting Entity Code DA)

Chain of Custody **Dallas Water Utilities Source Water Quality**

Project ID: **Semi-Annual Sampling CRP**

Chain of Custody

TRA Sample Receiving Form 6500 W. Singleton Blvd. Dallas, TX 75212
City of Dallas Water Utilities at 2900 White Rock Rd. Dallas, TX 75214

Date Collected	Time	Site ID	Sample Matrix	Analysis A	B	C	D	E	F	G	Number of Containers	Preservation Code	Filtered (Y/N)	Sampled by

Preservation Code:
1 = Ice
2 = Nitric Acid (HNO3)
3 = Sulfuric Acid (H2SO4)
4 = Hydrochloric Acid (HCl)
5 = Sodium Hydroxide (NaOH)
6 = Sodium Thiosulfate
7 = None
8 = Other______

REPORT TO: Source Water Quality (214)-670-0908
Alfonso.Morua@dallascityhall.com;Jessica.Staggs@dallascityhall.com
AND TO: Angela Kilpatrick (TRA) 817-493-5179

Source Water Quality Analyses Test Profile
Column A: TOC, BOD_5, NO_3, NH_3-N, OPO_4, TPO_4, TURB, TSS, TDS, Alk, Hard, Chloride
Column B: Algae, Chloro, Pheo, MIB, GEOS
Column C: Fecal
Column D: THM
Column E: Herbicides, Pesticides, VOC's
Column F: MTBE
Column G: Dissolved **Metals** (silver, aluminum, arsenic, barium, cadmium, chromium, copper, nickel, lead, selenium, and zinc)
Comments:

Relinquished by: ______________________ Date/Time

Received by: ______________________ Date/Time

Eurofins Xenco, Dallas
9701 Harry Hines Blvd
Dallas, TX 75220
Phone (214) 902-0300

Chain of Custody Record

eurofins Environment Testing America

Client Information	Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:
	Tiffany Klis, Jesus Trevino, Jayce Proctor	Allen, Jodi L		870-1294-154.1
Client Contact:	Phone:	E-Mail:	State of Origin:	Page:
Jessica Staggs	214-670-0296 (Tiffany)	Jodi.Allen@Eurofinset.com		Page 1 of
Company:	PWSID:			Job #:
City of Dallas				

Address:	Due Date Requested:
2900 White Rock Road	
City:	TAT Requested (days):
Dallas	
State, Zip:	Compliance Project: Δ Yes Δ No
TX, 75214	
Phone:	PO #:
214-670-0908(Tel)	Purchase Order Requested
Email:	WO #:
Jessica.Staggs@dallascityhall.com	
Project Name:	Project #:
City of Dallas - Source Water	
Site:	SSOW#:
December Monthly Samples	

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)
Other:	

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (w=water, s=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9223B_ColQT_8H - E. Coli	300_ORGFM_28D - (MOD) Drink Water Anions - Bromide	300.1_PREC - Bromate	Total Number of containers	Special Instructions/Note:
			Preservation Code:				R	N	L		
			G	Water	N	N	X			1	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements: Please report hold times (8hr hold) - E.Coli - MPN

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

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

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Chain of Custody

PALS Analytical Laboratory
1020 Sargent Road, Bldg. #27, Dallas, TX 75203
Phone: 214-670-7504
Fax: 214-670-7[illegible]

PROJECT ID/ SUBMITTING GROUP

Client Name: SWQ - Source Water Quality
Contact: Jessica Staggs
Sample Collector: ____________
Phone: 214-670-0908
E-mail: jessica.staggs@dallascityhall.com
Project: Monthly SWQ Samples

PRESERVATION CODES
1 = Ice
2 = Nitric Acid (HNO_3)
3 = Sulfuric Acid (H2SO4)
4 = Hydrochloric Acid (HCl)
5 = Sodium Hydroxide (NaOH)
6 = Sodium Thiosulfate
7 = None
8 = Other____________

MATRIX CODES
DW - Drinking Water
GRW - Ground Water
SW - Storm Water
WW - Wastewater
SL - Sludge
SO - Soils
IW - Industrial Waste
WS - Watershed
O - Other:

LAB ID #	Collection Date	Collection Time	Sample Description	Matrix	[illegible]	Preservation Codes	Number of Containers	Table 1 (see Analysis tables)	Table 2 (NH3 & T-Phos)	Table 3 (Hardness)	Table 4 (E. Coli)	Table 5 (Algae, Chloro, Pheo)	Table 6 (THM)	Table 7 (MIB Geosmin)	LAB USE ONLY - Container Temperatures (°C) Thermometer ID:

Relinquished by (Signature)	Date	Time	Received by	Date	Time

Comments:
Chlorine Present (Y/N)

LAB USE ONLY	Yes(Y) / No(N)
Samples intact on arrival:	
Received w/ ice:	
Properly preserved:	
Volatiles w/o air space:	
Proper containers:	

Analysis tables
Table 1: TOC, BOD5, NO3, OPO4, TURB, TSS, TDS, Alk, Chloride, Chlorine (Non-preserved samples)
Table 2: Ammonia and T-Phos (Preserved samples)
Table 3: Hardness (Preserved samples)
Table 4: E. coli, Table 5: Algae, Chlorophyll, Pheophytin
Table 6: THM, Table 7: MIB Geosmin

Document Number: DWU-FRM-060-PALS AL
Approved By: Sr. Program Manager

Document Title: Chain of Custody Form
Description: Initial Release

Revision Number: 1
Effective Date: 6/25/2021

Chain Of Custody

DFW

DALLAS/FORT WORTH INTERNATIONAL AIRPORT
3200 EAST AIRFIELD DRIVE, P.O. BOX 619428
DFW AIRPORT, TEXAS 75261-9428
T 972 574 1700 F 972 574 9656

Turnaround Time:

Normal: 5 to 7 Days ☐

Rush: 2 Hr ☐ 24 Hr ☐ 3 Day ☐

Comments:

Sample Receipt (Laboratory Use Only)	Yes	No
1a. Samples @ 4degrees Celsius?		
1b. Temperature of Cooler?		
2. Samples received intact?		
3. Zero Headspace for VOC's?		
4. Correct containers used?		
5. Adequate volume provided?		
6. Samples preserved correctly?		
7. Samples received within holding time?		
8. Agreement between COC and sample labels?		

Project Information

Attn: _____ Environmental Affairs

Project: Watershed Management

Sampled By

Special Instructions

Disposal: Dispose ☐ Return ☐ Pickup ☐ Hold ☐

Analysis(es) Requested (List specific method, if required) & [Preservative]

Sample ID	Collect Date	Collect Time	Matrix	TPH/Total Petroleum Hydrocarbons (1005) [H]	BTEX/Aromatic Hydrocarbons (602/8021B) [H]	Chloride		Corrosivity/pH	Dissolved Aluminum	E. Coli	Oil & Grease (1664) [H]	BOD	Zinc	TSS	Glycol (8015m)	OPP	Copper	Nickel	Ammonia [S]	The 8 RCRA Metals by Total Digestion	Sulfate	TKN	Nitrate	Nitrite	NO2 and NO3	COD [S]	CBOD	Orthophosphate	T. Phosphate	Chlorophyll A	Number of Containers

Relinquished By (Signature):	Date	Time	Received By (Signature):	Time
Relinquished By (Signature):	Date	Time	Received By (Signature):	Time

Preservative: [H] = Hydrochloric Acid HCl , [N] = Nitric Acid HNO3, [S] = Sulfuric Acid H2SO4, [O] = Other

City of Dallas

City of Dallas - Dallas Water Utilities SWO WQ
Chain of Custody: (PROJECT:) Lab ID _____

Laboratory :	**DWU SWO WQ Contact Person:**
Sampler Name :	**Telephone #: 2149484269** **Kevin.Hill@dallascityhall.com**
Sampler Signature :	**Lab Analysis Requested**
TAT: **Normal**	
Other **Temp**	
Comments:	

Sample ID	Sampled Date	Sampled Time	Sample Type (G/C)	Matrix (W/S/SL/SD/CL)	Cont. type (Plastic/Glass/Plastic&Glass)	# of Container (s)	Preservative* See code below	Lab Analysis Requested

Relinquished By (Print):	Date:	Time:	Received By (Print):	Date:	Time:
Relinquished By (Sign):	Date:	Time:	Received By (Sign):	Date:	Time:
Relinquished By (Print):	Date:	Time:	Received By (Print):	Date:	Time:
Relinquished By (Sign):	Date:	Time:	Received By (Sign):	Date:	Time:
Method of Transfer:	Received for Laboratory By:			Date:	Time:

Perservatives
1. HNO_3 2. H_2SO_4 3. HCl 4. Ice

Eurofins Dallas
9701 Harry Hines Blvd
Dallas, TX 75220
Phone (214) 902-0300

Chain of Custody Record

eurofins | Environment Testing

Client Information	Sampler:	Lab PM: Kimmel, Mike	Carrier Tracking No(s):	COC No: 870-3625-683.1
Client Contact: Kayla Miller	Phone:	E-Mail: Mike.Kimmel@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: City of Fort Worth	PWSID:			Job #:
Address: 200 Texas Street	Due Date Requested:			
City: Fort Worth	TAT Requested (days):			
State, Zip: TX, 76102-6314	Compliance Project: Δ Yes Δ No			
Phone: 817-392-5454(Tel)	PO #: Purchase Order not required			
Email: kayla.miller@fortworthtexas.gov	WO #:			
Project Name: CRP Sampling	Project #: 87001307			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9223B_ColQT_8H - Total Coliform/ECOLI-SM9223B	350.1 (NH3), 353.2 (NOX), 365.1 (TPHOS)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				R	S		
16120 Handley Ederville				Water						
17369 Sycamore				Water						
21801 Marine Creek				Water						
22326 Rodeo Park				Water						
21558 Jacksboro				Water						
18456 University				Water						
22236 Marys				Water						
Duplicate				Water						
17369 Sycamore				Water						

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

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

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

LAB CONTOL NO:_____ CHAIN OF CUSTODY: YES:_____NO:_____

SITE NO.: GP-_____

CITY OF GRAND PRAIRIE
ENVIRONMENTAL SERVICES DEPARTMENT
STREAM ANALYSIS REQUEST FORM

GRAND PRAIRE SAMPLE NO:_____ COLLECTED BY:_____

GRAB_____ COMPOSITE_____ DATE COLLECTED:_____

LOCATION:_____ TIME COLLECTED:_____

MATERIAL SAMPLED:_____ TRANSPORTED BY:_____

PRESERVATIVE:_____ DATE RECEIVED:_____

CONTAINER TYPE: GLASS____ PLASTIC____ VOA____ VOLUME_____ RECEIVED BY:_____

LABORATORY PARAMETERS:

	SOLIDS TESTING		ROUTINE TESTING		METAL DISS:____ TOTAL:____
	TOTAL SUSPENDED SOLIDS		ALKALINITY phph as CaCO3		ALUMINUM
	VOLATILE SUSPENDED SOLIDS		ALKALINITY-TOTAL as CaCO3		ANTIMONY
	TOTAL DISSOLVED SOLIDS		AMMONIA NITROGEN		ARSENIC
	TOTAL SOLIDS		BICARBONATE		BARIUM
	TOTAL VOLATILE SOLIDS		CARBONATE		BERYLLIUM
	PERCENT TOTAL SOLIDS		CHEMICAL OXYGEN DEMAND		BORON
	PERCENT VOLATILE SOLIDS		CHLORIDES		CADMIUM
			CHLOROPHYLL A		CALCIUM
	BIOCHEMICAL OXYGEN DEMAND		CYANIDES		CHROMIUM
	5-DAY TOTAL		GREASE & OIL		CHROMIUM +6
	5-DAY CARBONACEOUS		FLOURIDES		COBALT
	7-DAY TOTAL		HYDROGEN SULFIDE		COPPER
	7-DAY CARBONACEOUS		HARDNESS		IRON
			INFRARED		LEAD
	BIOLOGICAL TESTING		TOTAL KJELDAHL NITROGEN		MAGNESIUM
	TOTAL COLIFORMS (FILTERED)		NITRATE NITROGEN		MANGANESE
	TOTAL COLIFORMS (MMO-MUG)		NITRITE NITROGEN		MOLYBDENUM
	E COLIFORM		TOTAL NITROGEN		MERCURY
	FECAL COLIFORMS		PH		NICKEL
	FECAL STREPTOCOCCUS		PHENOLS		POTASSIUM
	MICROSCOPIC EXAMINATION		PHEOPHYTIN		SELENIUM
			PHOSPHORUS-ORTHO		SILICA
	GAS CHROMATOGRAPHY		PHOSPHORUS-TOTAL		SILVER
	PESTICIDE SCAN		SPECIFIC CONDUCTANCE		SODIUM
	HERBICIDE SCAN		SULFATES		THALLIUM
	PCBs		SULFIDES		TIN
	THM'S		TOTAL ORGANIC CARBON		VANADIUM
	VOC'S		TOTAL PETROLEUM HYDROCARBONS		ZINC
			GC/MS		
			TTO VOLATILE SCAN		
			BASE NEUTRALS SCAN		
			ACID EXTRACTABLE SCAN		

FIELD PARAMETERS:

DAYS SINCE LAST RAIN:_____ FLOW SEVERITY:Circle One Number (1) No Flow (2) Low Flow (3) Normal Flow (4) Flood (5) High Flow (6) Dry

Water Temp:_____ DO:_____ pH:_____ DO % Saturation:_____ Other (_____):_____

Conductivity:_____ Turbidity:_____ Ammonia:_____ Air Temperature:_____ Secchi Disk Depth:_____

LEGACY FIELD PARAMETERS (indicate with an X):

STREAM STAGE:_____ WEATHER: Total Cloud Cover_____Cloudy but Broken_____Cloudy Sunny_____Clear:_____

WATER COLOR: Clear____ Light Brown____ Medium Brown____ Dark Brown____ Milky____ Light Green____ Dark Green____ Other____

VELOCITY: None_____Sluggish_____Moderate_____Rapid_____

TRA TEST PARAMETERS: Monthly_____Quarterly_____Annual_____

FIELD OBSERVATIONS:_____

SPECIAL TESTING:_____ LABORATORY OFFICIAL:_____

**SEE ATTACHMENT FOR ANALYTICAL RESULTS DATE REPORTED:_____

GP-ESR-0001 REV 05/19

IRVING
TEXAS

S –

Lab No. _____

Sample Data Sheet – Stormwater

Sampler No.: _____ Sampler: _____

Location: _____ No. of Containers: _____

Source: ❑ Stream ❑ Storm Event ❑ CRP ❑ Other: _____

Date Collected: _____ / _____ / _____ Time: _____ ❑ a.m. ❑ p.m.

Type of Samples: ❑ Grab ❑ Composite ❑ Manual ❑ Auto

Container(s): ❑ Cubitainer ❑ Bacti Bottle ❑ Glass Jar ❑ Other: _____

Preservative(s): ❑ Ice ❑ H2SO4 ❑ HNO3 ❑ Other: _____

Sample Depth: _____ Days Since Last Rainfall: _____ / _____ in.

Flow Severity: ❑ No Flow ❑ Low ❑ Normal ❑ Flood ❑ High ❑ Dry

Observations: _____

_____

_____

Parameter	Parameter	Parameter	Parameter
❑ BOD	❑ TKN	❑ As, Total	❑ As, Diss
❑ COD	❑ TDS	❑ Cd, Total	❑ Cd, Diss
❑ Hardness	❑ TSS	❑ Cu, Total	❑ Cu, Diss
❑ Nitrogen, Ammonia	❑ TOC	❑ Cr, Total	❑ Cr, Diss
❑ Nitrite	❑ TPH	❑ Pb, Total	❑ Pb, Diss
❑ Nitrate	❑ BTEX	❑ Ni, Total	❑ Ni, Diss
❑ Nitrate + Nitrite-N	❑ E. Coli	❑ Zn, Total	❑ Zn, Diss
❑ Chlorophyll A	❑ Fecal Strep	❑ Other _____	
❑ Phos (T)	❑ Atrazine	❑ Other _____	
❑ Phos (O)	❑ Oil and Grease	❑ Other _____	

Field Parameters

DO: _____ mg/L DO%: _____ pH: _____ SpC: _____ Tair: _____ Twater: _____

Chain of Custoday

I certify this sample was collected by me at the time and date shown and remained in my custody until transferred to the undersigned.

_____ _____ _____ ❑ a.m. ❑ p.m.
Sampler Signature Date Time

_____ _____ _____ ❑ a.m. ❑ p.m.
Received by Signature Date Time

Form # 32055
Rev. 8/22

TRINITY RIVER AUTHORITY - LAKE LIVINGSTON PROJECT

SS
Field ID Number

P. O. Box 360, Livingston, Tx 77351 ph 936 365 2292

FIELD DATA SHEET

Program or Project Name: _____

Date:

Station ID Number: _____ Collected By: _____ Time: _____

Station Description: _____

Flow(cfs): _____

Air Temperature(C): _____ Days Since Last Rain: < 1 > 7 Other ____ Inches: _____

Evidence of Primary Contact Rec (0=Not Observed, 1=Observed):_____ # of People Observed: _____

Observations (weather, water appearance, etc.): _____

Analyses to be Conducted - see reverse

Stream Sample Routine	
Dissolved Metals	
Total Metals	
Field Parameters only	
Special Study	
Other	
TKN Analysis	

(Sample submitted to TRA CRWS lab)

Flow Severity:_____

1=No Flow, 2=Low, 3=Normal, 4=Flood, 5=High, 6=Dry

Secchi Disc: _____ meters

YSI Multi - Probe Calibration

S.N. of Sonde used: _____

FIELD PARAMETERS

Sample Depth	Water Temp.	D.O.	pH	Conductivity

Containers Collected

Container/ Parameter Group Code	Quantity	Volume mL	Presevation and Parameter Group
A	_____	1000 or _____	H2SO4 (NH3, TPO4, Hard, TKN)
B	_____	1000 or _____	Filtered (NO2, NO3, Cl, SO4, OPO4, TDS
C,D	_____	1000 or _____	Plain (Alk, TSS)
E	_____	100 or _____	Bacteriological (E. coli)
F	_____	1000 or _____	Amber Glass (Chlorophyll)
G	_____	1000 or _____	HNO3 (Se)
H	_____	500 or _____	HNO3 Filtered (Fe, Ni, Mn, Zn, Al Cr, Cd, Pb, Cu, Ag, As)
_____	_____		other

Field Preservation Unique Chem # _____

Matrix = Water Containers are plastic except as noted

Temp. of samples upon receipt _____ degrees C

OK? Y N In transit on ice? Y N

Relinquished By:_____ Date/Time: _____

Received By:_____ Date/Time: _____

Relinquished By:_____ Date/Time: _____

Received By:_____ Date/Time: _____

Comments:

For stream sites that are not wadeable, no total water column depth is reported and the sample depth is defaulted to 0.3 m.

For wadeable streams total water column depth is derived from the flow measurement form.

For lake sites, total water column depth is obtained from the profile data for that particular site.

NTMWD Chain of Custody Record

Comp. Sx. Beg/End Date/Time ______________________

Sample Collector Name(s): ______________________

Work Order Number: ______________

Project: ______________

Reviewed By: ______________

Page ____ of ____

Effluent Residual Chlorine

__________ mg/L

Version 1.0

Date	Time	Type	Sx. Num	Sample Name

Temperature IR#				
Cooler Info				
C	TempC		Ctr	On Ice
#	Obs.	Cor.	ID	Y / N
1				
2				
3				
4				
5				
6				

Preservation

Chk./Adj. By

pH Strips:N______

Items Adjusted

to pH < 2

Reagent:N______

ID	pHi	ID	pHi

to pH > 10

Reagent:N______

ID	pHi	ID	pHi

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

Relinquished by:	Date	Time	Received for Laboratory by:	Date	Time	Remarks:

Legend:FC=Flow Composite, Obs.=Observed, Cor.=Corrected

C:36-702R:0.0:06/27/22

CHAIN OF CUSTODY

Revision 2016.1

Page ___ Of ___

XENCO LABORATORIES

Setting the Standard since 1990

Stafford, TX (281) 240-4200 | El Paso, TX (915) 585-3443 | Midland, TX (432) 704-5440 | Phoenix, AZ (480) 355-0900 | Service Center- Amarillo, TX (806)678-4514
Dallas, TX (214) 902-0300 | Lubbock, TX (806) 794-1296 | San Antonio, TX (210) 509-3334 | Service Center - Baton Rouge, LA (832) 712-8143 | Service Center- Hobbs, NM (575) 392-7550

www.xenco.com

Xenco Quote # | Xenco Job #

Client / Reporting Information

Company Name / Branch:
Company Address:
Email: Phone No:
Project Contact:
Samplers's Name:

Project Information

Project Name/Number:
Project Location:
Invoice To:
PO Number:

Matrix Codes

W = Water
S = Soil/Sed/Solid
GW = Ground Water
DW = Drinking Water
P = Product
SW = Surface Water
SL - Sludge
OW = Ocean/Sea Water
WI = Wipe
O = Oil
WW = Waste Water
A = Air

Analytical Information

No.	Field ID / Point of Collection	Collection: Sample Depth	Collection: Date	Collection: Time	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH/Zn Acetate	HNO3	H2SO4	NaOH	NaHSO4	MEOH	NONE	Field Comments
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															

Turnaround Time (Business days) | Date Deliverable information | Notes:

- ☐ Same Day TAT
- ☐ Next Day EMERGENCY
- ☐ 2 Day EMERGENCY
- ☐ 3 Day EMERGENCY
- ☐ 5 Day TAT
- ☐ 7 Day TAT
- ☐ Contract TAT
- ☐ Level II Std QC
- ☐ Level III Std QC+ Forms
- ☐ Level 3 (CLP Forms)
- ☐ Level II Report with TRRP checklist
- ☐ Level IV (Full Data Pkg /raw data)
- ☐ TRRP Level IV
- ☐ UST / RG -411

TAT Starts Day received by Lab, if received by 5:00 pm

FED-EX / UPS: Tracking #

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION, INCLUDING COURIER DELIVERY

Relinquished by Sampler: 1	Date Time:	Received By: 1	Relinquished By: 2	Date Time:	Received By: 2
Relinquished by: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal #	Preserved where applicable	On Ice / Cooler Temp. / Thermo. Corr. Factor

LIMS # (TRA Lab No.): _____ **A2**

LIMS Text ID (TRA Lab ID): _____ **PEM CRP**

TRA MAIN STEM ROUTINE

Tag No: TR19686

Station: 21423 - West Fork TR at River Legacy Park footbridge

Lat/Long: 32.788415, -97.10061

Date: _____ **Sample pH:** _____

Time: _____

Collected By: _____

Notes:

Analyses to be conducted	Quantity	Volume	Matrix	Preservative	Filtered	Parameters
E. coli	1	100ML NaThio	Water	ICE	NO	E. coli
Chlorophyll-a	1	1000ML amber plastic	Water	ICE	NO	Chlorophyll-a
TP						
NH3	1	1000 ML	Water	H2SO4	NO	TP, NH3, TKN, Hardness
TKN	1	1000 ML	Water	ICE	NO	NO3, D-OPO4-P, NO2
Hardness	1	1000 ML	Water	ICE	NO	Chloride, TDS, SO4
NO3						
D-OPO4-P						
NO2						
Chloride						
TDS						
SO4						

Relinquished By: _____ Relinquished By: _____

Date/Time: _____ Date/Time: _____

Received By: _____ Received By: _____

Date/Time: _____ Date/Time: _____

Customer: Environmental Planning and Management

Attention: Angela Kilpatrick
Trinity River Authority Clean Rivers Program
5300 South Collins, Arlington, TX 76018

Corrections must be made with a single strike-thru and initialed. No writeovers, scratchouts, or whiteout.

UPPER TRINITY REGIONAL WATER DISTRICT

CHAIN OF CUSTODY RECORD
FIELD DATA SHEET

CRP

LIMS # (TRA Lab No.)_____
LIMS Text ID (TRA Lab ID)_____

Lat: Long: **Date:**

Tag No:

Station: _____ Time: _____
Sample(s) Collected By:_____
Secchi Depth (m): Appears_____ Disappears_____ Avg _____
Air Temperature(^{0}C):_____ Days Since Last Rain:_____ Flow(cfs):_____
Method: 1=Gage 2=Electric 5=Doppler

Drought Parameters
Depth at Sample Site (m):_____ Max Pool Width (m):_____ Max Pool Depth (m):_____
Pool Length (m):_____ % Pool Coverage in 500 Meter Reach:_____

Observations (weather, obvious signs of eutrophication, etc.): _____

Analyses to be Conducted

Samples Collected

quantity	volume	Matrix	preservative	filtered	Parameters

FIELD PARAMETERS

Flow severity: _____

If site is wadeable, depth of water column (m): _____
<0.5 m: collect at 1/3 depth from surface
>0.5 m & <1.5 m: collect at 0.3 meters from surface
>1.5 m: profiles if possible otherwise at 0.3 meters from surface
>1.5 m to <3 m: 0.3 m from surface, mid-depth, 0.3 m from bottom

Corrections must be made with a single strike-thru and initialed. No writeovers, scratchouts, or whiteout.

Sample Depth	Water Temp (^{0}C)	pH (SU)	Sp Cond uS/cm	DO mg/L
Calibration Acceptable				

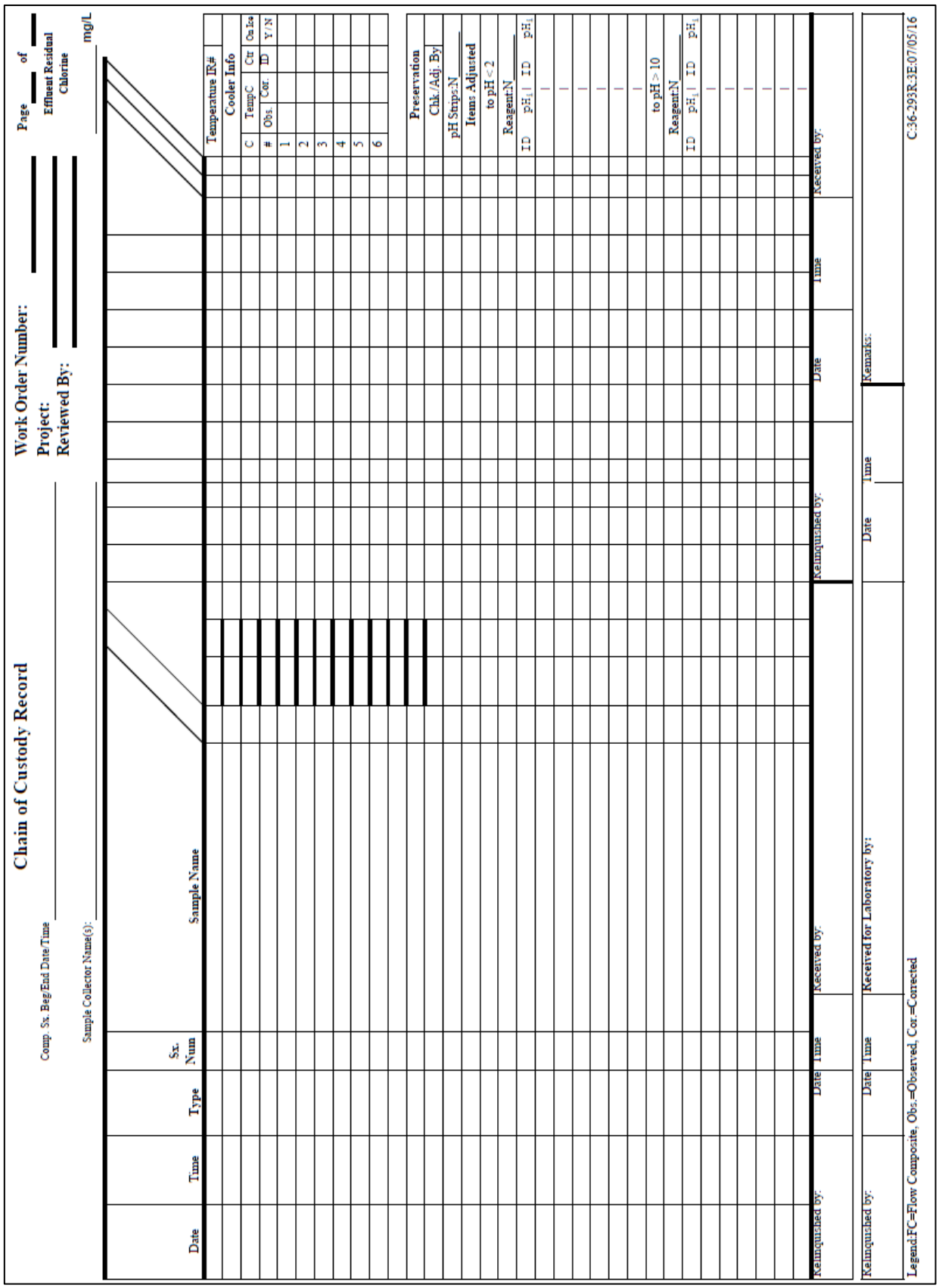
Relinquished By: _____
Date/Time: _____
Received By: _____
Date/Time: _____

Relinquished By: _____
Date/Time: _____
Received By: _____
Date/Time: _____

Copy before delivering original to lab; sheet must be signed prior to submittal of samples.

Customer: Upper Trinity Regional Water District
Attention: Angela Kilpatrick
Trinity River Authority Clean Rivers Program
5300 South Collins, Arlington, TX 76018

Michelle Carte
UTRWD QA Officer
900 N Kealy, Lewisville, TX 75057


Chain of Custody Record
Work Order Number:
Project:
Reviewed By:
Page ___ of ___
Effluent Residual Chlorine
mg/L
Comp. Sx. Beg/End Date/Time
Sample Collector Name(s):
Date
Time
Type
Sx. Num
Sample Name
Temperature IR#
Cooler Info
C
Temp:C
Obs.
Cor.
Ctr
ID
Custs
Y/N
#
1
2
3
4
5
6
Preservation
Chk./Adj. By
pH Strips:N
Items Adjusted to pH < 2
Reagent:N
ID
pH1
to pH > 10
Reagent:N
Relinquished by:
Date
Time
Received by:
Relinquished by:
Date
Time
Received for Laboratory by:
Date
Time
Remarks:
Legend:FC=Flow Composite, Obs.=Observed, Cor.=Corrected
C:36-293R:3E:07/05/16

Appendix F: Data Review Checklist and Summary Shells

Data Review Checklist

Name of Associated Text Files:	
DATA REVIEW CHECKLIST	
Title of associated QAPP:	

Data Format and Structure		**Y, N, or NA**
A.	Are there any duplicate *Tag ID* numbers in the *Events* file?	
B.	Do the *Tag* prefixes correctly represent the entity providing the data? Prefix is two letters [TR for TRA submitted data] followed by 5 numbers/4 number & 1 letter.	
C.	Have any *Tag ID* numbers been used in previous data submissions?	
D.	Are TCEQ station location (SLOC) numbers assigned? 5 digit code.	
E.	Are sampling *Dates* in the correct format, MM/DD/YYYY with leading zeros? End date and Start date.	
F.	Is the sampling *Times* based on the 24 hour clock (e.g. 13:04) with leading zeros? End time and Start time.	
G.	Is the *Comment* field filled in where appropriate (e.g. unusual occurrence, sampling problems, unrepresentative of ambient water quality)? Is the Comment field 135 characters or less?	
H.	*Submitting Entity, Collecting Entity* and *Monitoring Type* codes used correctly?	
I.	Are the sampling dates in the *Results* file the same as the one in the *Events* file for each *Tag ID*?	
J.	Are values represented by a valid parameter code with the correct units and leading zeros? 5 digit code with leading zeros.	
K.	Are there any duplicate parameter codes for the same *Tag ID*?	
L.	Are there any invalid symbols in the Greater Than/Less Than *(GT/LT)* field?	
M.	Are there any tag numbers in the *Results* file that are not in the *Events* file or vice versa?	
N.	If there are any composite samples, are the *Category* and *Type* fields filed out correctly? Categories: T=Time [like diels], S=Space, B=Both Time and Space [like ALMs], F=Flow Weight Type must be populated if Category is populated. Types: If Category=T or S, then Type=# of samples in composite [like 96 for diels]. If Category=B, then Type=CN [continuous]. If number of samples is unknown, then Type=GB.	

Data Quality Review		**Y, N, or NA**
A.	Does the data conform to quality assurace specifications as outlined in the QAPP?	
B.	Are all the "less than" values reported at or below the LOQ? **If no, explain in the Data Summary.**	
C.	Have the outliers been verified and a "1" placed in the *Verify_flg* field?	
D.	Have checks on correctness of analysis or data reasonableness been performed? e.g.: Is ortho-phosphorus greater than total phosphorus? Are dissolved metals 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 that site?	
E.	Have at least 10% of the data in the data set been reviewed against the field & laboratory data sheets?	
F.	Are all parameter codes in the data set listed in the QAPP?	
G.	Are all stations in the data set listed in the QAPP?	

H.	Have data been rounded correctly? ■ Use round to even rules. □For tenths, 9.35=9.4, 9.45=9.4. □For 3 significant figures, 1245=1240, 1.235=1.24. ■ Air temperature, w ater temperature, DO, and pH rounded to nearest tenth. □ Includes grab and diel parameters such as 00010, 00020, 00300, 00400, 00209, 00210, 00211, 00215, 00216, 89855, 89856, 89857. □ If rounded value is a w hole number, make sure to add ".0" ■ Specific conductance to 3 significant figures. □ Includes grab and diel parameters such as 00094, 00212, 00213, 00214. ■ Secchi depth (00078) to 2 significant figures. ■ Censor bacteria reported as less than 1 to "<1". Other values, round to w hole number and then to tw o sig figs. □ 0.57=<1, 4356.5=4356=4400. □ Includes parameters such as 31699, 31701, 31616, 31673. □ Other <values are common due to dilution (<2, <5, <10, etc.) ■ Round instantaneous flow (00061). □ Values less than 0.01, censor to "<0.01". □ Values >=0.01 to <0.1, 2 or 3 significant figures. □ Values>=0.1 to <10, nearest tenth. □ Values>=10, nearest w hole number. ■ Days Since Last Precipitation (72053) should be reported as "<1" if there is precip at the time of sampling. ■ If flow severity (01351) is 1=No Flow, a flow value (00061) of "0 cfs" should be reported; flow method (89835) should not be reported. □ Any flow estimate (74069) values should not have a flow method (89835) reported.	

Documentation Review		**Y, N, or NA**
A.	Are blank results acceptable as specified in the QAPP?	
B.	Were control charts used to determine the acceptability of field duplicates?	
C.	Was documentation of any unusual occurrences that may affect water quality included in the *Event* file *Comments* field?	
D.	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.**	
E.	Were there any failures in field and laboratory measurement systems that were not resolvable and resulted in unreportable data? **If yes, explain in Data Summary.**	
F.	Was the laboratory's NELAC Accreditation current for the analysis conducted?	

DATA SUMMARY

Data Set Information

Data Source:

Date Submitted:

Tag_ID Range:

Date Range:

Number Events/Results:

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

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

Planning Agency Data Manager:

Date:

Comments:

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

- Inconsistencies with AWRL specifications or LOQs.
- Failures in sampling methods and/or laboratory procedures that resulted in data that could not be reported to the TCEQ (indicate items for with the Corrective Action Process has been initiated).
- Include completed Corrective Action Plans with the applicable Progress Report.

Explain any values that are reported as ">".

Affected Data

Parameter	Tag IDs Affected	Type of Problem	Reason for Problem	Number Expected	Number Expected Details	Number Lost	Percent Loss*	Corrective Action (Y/N/SOP)
Ex - pH	XL12345	Post calibration	Equipment failure				4%	SOP
Ex - pH	XL12346	Post calibration	Forgot to write in log				4%	N
Ex - TKN	XL12351-XL12353	Laboratory analysis	LOQ Check Sample failed				10%	Y
Ex - TOC	XL12345-XL12350	Exceeded hold time	Sample received lat in day and not set up next day.				10%	Y
Ex - Zinc	XL12365	Field equipment blank	Possible contamination				4%	N

*Percent Loss = # Data Points Lost / # Data Points Expected for that parameter in the data set.

Appendix G: TRA CRP Data Management Plan, Revised May 2023

INTRODUCTION

TRA was created in 1955 to provide a range of water-related services in the Trinity River basin. Among those duties, the Authority is to maintain a Master Plan for the conservation and use of water resources in the Trinity River basin. In 1991 the Texas Legislature enacted Senate Bill 818, the Clean Rivers Act, which requires each river authority in the state to perform water quality assessments in their respective river basins. The Trinity River Authority administers the Clean Rivers Program in the Trinity basin under contract with the Texas Commission on Environmental Quality. TRA's objectives are to establish and maintain a comprehensive, quality assured database concerning the quality of waters in the Trinity River basin and to make such data available in a uniform, usable format as to allow highly informed decisions to be made concerning these waters. The data management plan herein detailed describes the mechanisms and procedures to be used in obtaining the above stated objectives.

The Trinity River Authority Clean Rivers Program obtains data from three primary sources. These sources are within-basin participating agencies (WBPA), TRA routine sampling, and special studies. Each of the WBPAs maintain their own database(s) which exist in a variety of formats and can be very large. Generally, each entity has designed and implements data collection programs on its own initiative, utilizing funds independent of the CRP. WBPAs submit data routinely to TRA. Subcontractors, in contrast, may be used to conduct special studies, which may be limited in scope and time. Water quality data obtained from the above listed sources will be submitted to the TCEQ only after programs generating data are covered under the TRA QAPP or upon approval of the TCEQ.

It may at times be desirable to obtain data from sources other than those listed above. These alternate sources may include the Texas Commission on Environmental Quality, U. S. Geological Survey, Texas Parks and Wildlife Department, U. S. Fish and Wildlife Service, and U. S. Army Corps of Engineers.

The Clean Rivers Program has identified various additional databases which may be included in this program, especially geographic coverages for sampling sites, wastewater discharges, water rights, underground and above ground storage tanks, oil and gas wells, water supply wells, and landfills.

The CRP cycle begins on September 1 of odd years, which is the start of the first fiscal year of the state biennium and is the start of each CRP contract between TCEQ and TRA. The workplan for each biennium is developed beginning the preceding spring. TRA seeks recommendations from and develops basin-wide priorities with the Trinity CRP Steering Committee. TCEQ develops state-wide priorities with the CRP stakeholders group and the Long Term Objectives Committee. Basin-wide and state-wide priorities are combined in a workplan, which is then incorporated as a scope of services in the two-year TCEQ/TRA contract. The TRA cycle is based on its fiscal year beginning December 1. Budget preparation begins early in the year and the budget is made final in October. CRP activity must be included in the budget in categories such as personnel, subcontracts, capital, etc. Many actions involving TRA CRP do not directly affect other authority programs and are planned simply according to TCEQ CRP requirements. However, some actions involving computers are planned on an authority-wide basis and TRA CRP must adapt to those actions.

DATA MANAGEMENT PERSONNEL

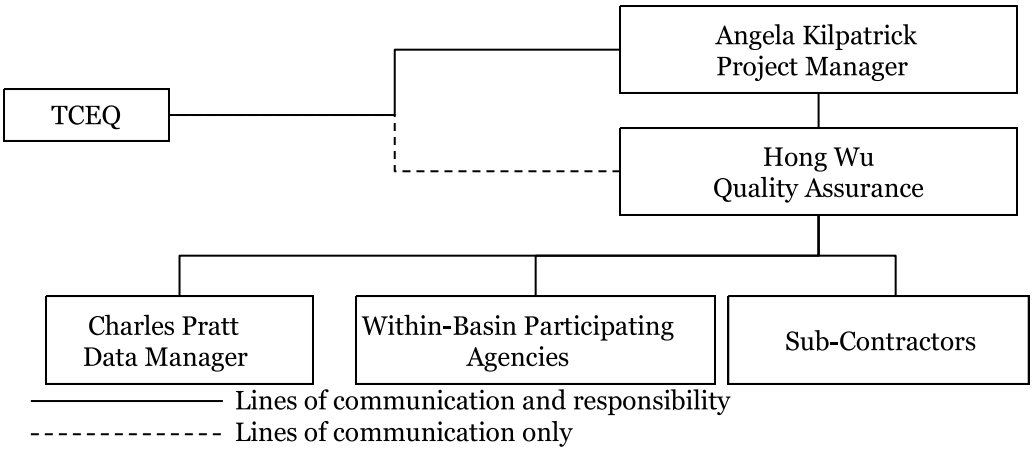
1. TRA Project Manager
   a. Responsible for coordinating and directing the implementation of the QA program.
   b. Responsible for coordinating with the TCEQ QAS to resolve QA-related issues.
   c. Coordinates and monitors deficiencies and corrective action in cooperation with the TRA Quality Assurance Officer.
2. TRA Quality Assurance Officer
   a. Responsible for coordinating with the TCEQ QAS to resolve QA-related issues.
   b. Notifies the TRA Project Manager of particular circumstances which may adversely affect the quality of data.
   c. Responsible for coordinating the implementation of the QA program under the direction of the TRA Project Manager.
   d. Coordinates and monitors deficiencies and corrective action under the direction of the TRA Project Manager.
   e. Responsible for determining if all data collected meet the data quality objectives of the project and are suitable for reporting to the TCEQ.
   f. Coordinates and maintains records of data verification and validation under the direction of the TRA

Project Manager.

g. Responsible for ensuring that field and lab data properly reviewed and verified and oversees the TRA Data Manager in conducting these duties.
h. Converts TRA RS&C LIMS data for TRA and WBPAs into the data submittal template or oversees the work of the TRA Data Manager in conducting these duties.
i. Oversees the work of the TRA Data Manager for field and lab data review and verification.
j. Responsible for the transfer of basin quality-assured water quality data to the TCEQ in a format compatible with SWQMIS.
k. Maintains quality-assured data on TRA internet sites.

3. TRA Data Manager
   a. Responsible for TRA CRP field data entry and conversion of TRA RS&C LIMS data for TRA and WBPAs into the data submittal template under the supervision of the TRA QAO.
   b. Works under the direction of the TRA Quality Assurance Officer to ensure that field and lab data are properly reviewed and verified.
   c. Works under the direction of the TRA Quality Assurance Officer to coordinate and maintain records of data verification and validation.
4. Within-Basin Participating Agencies (WBPAs)
   a. WBPAs have their own staff with designated responsibilities. See Section A4 of this QAPP for further explanation.
5. TCEQ
   a. TCEQ has their own staff with designated responsibilities. See Section A4 of this QAPP for further explanation.

DATA MANAGEMENT PERSONNEL CHART



DATA HANDLING, HARDWARE, AND SOFTWARE REQUIREMENTS

1. Hardware and Software
   a. Hardware
      i. PC's – housed in the offices of the PM, QAO, DM, and field staff; maintained by IT personnel
      ii. Network Server – housed and maintained by IT personnel
      iii. Printers (through network) – located throughout office building, maintained by IT personnel
      iv. Field laptops/tablets – housed in the offices of the PM, QAO, and/or field staff; maintained by IT personnel
   b. Software
      i. OS - Windows Office 10 Pro
      ii. Database - Microsoft Access 2019
      iii. Spreadsheet – Microsoft Excel 2019
      iv. Word processing - Microsoft Word 2019
      v. Browser – Google Chrome
      vi. Internet email - Microsoft Outlook 2019
      vii. Mapping software
         1. Google Earth
         2. ArcGIS Pro 2.4.3 (or later)
   c. Internet

i. Provider – Level 3 Communications
ii. Address - http://www.trinityra.org/clean-rivers-program.htm
iii. Email - kilpatricka@trinityra.org
iv. Internet data linked to TCEQ data viewer at http://www80.tceq.texas.gov/SwqmisPublic/public/default.htm

2. Database Design
   a. Primary database design and file structures
      i. Excel templates are customized for each WBPA by the TRA Quality Assurance Officer. These templates include data entry sections for each station sampled by the WBPA. Each section contains lines for each parameter sampled. Each line also includes the LOQ and common outlier minimum and maximum values to aid in initial data quality assurance by the WBPA. These templates are manually populated by the WBPA QAO and the resultant files are submitted to the TRA Quality Assurance Officer on a routine basis. The files are then stored in a data archive folder on the network (primary storage) until the TRA Quality Assurance Officer or TRA Data Manager begins quality assurance procedures for submittal of the data to TCEQ. Quality assurance takes place within the Excel file with the use of several formulas and pivot tables. Once quality assurance has been completed, the TRA Quality Assurance Officer submits the data files to the TCEQ CRP Project Manager and moved the data into the TRA CRPDatabase (final storage).
         1. WBPA QAOs will be responsible for answering the following questions in the data submittal template prior to submittal of the data to TCEQ. Items k to s are unique to entities that submit laboratory data from outside labs (labs other than TRA RS&C).
         a. Are the entered data consistent with the pre-loaded station/ID/parameter/code?
         b. Are the units of the entered data consistent with the pre-loaded units? If not, convert to the specified unit.
         c. Are the sampling methods consistent with the preloaded methods? If not, explain why in the Notes field.
         d. Are all "less than" values reported at or below the LOQ? If not, explain why the less than value is reported above the LOQ in the Notes field.
         e. Are there outliers? Need to verify if it is an outlier or an error. If the value is accurate and outside of the range in the Minimum/Maximum Value columns, explain why the value is a verified outlier.
         f. Are the dates/time in the correct format?
         g. Are all values associated with a depth?
         h. Are the GT/LT signs and results separated? If not, separate into the GT/LT and Result columns.
         i. Are there any blanks in results? Make notes explaining why data is missing.
         j. Are there equipment blanks for all metals?
         k. Are sample storage, preservation, and hold times consistent with QAPP Table B2.1?
         l. Are analytical methods consistent with those listed in the QAPP Table A7 for your entity?
         m. Are LOQs consistent with those listed in the QAPP Table A7 for your entity? If LOQ is greater than the LOQ listed in the QAPP, provide an explanation of this deviation in the Notes field.
         n. Are LOQ check sample % recoveries provided in the lab report and consistent with the ranges defined in the QAPP Table A7 for your entity?
         o. Were LCS and LCS Duplicates conducted?
         p. Are precision values (RPD of LCS/LCS Duplicate results) consistent with the ranges defined in the QAPP Table A7 for your entity?
         q. Is the bias (% recovery of LCS and LCS Duplicate) consistent with the ranges defined in the QAPP Table A7 for your entity?
         r. Are method blanks run at levels at or below the LOQ?
         s. Is the precision (difference between the logarithm of the result and logarithm of the lab duplicate result) less than or equal to 0.5 for bacteriological parameters?
      ii. The CRPDatabase is housed on the TRA's network. Three (3) ancillary Access tables (Site IDs, Metadata and StoretCodes) are located in Reference Tables database or CRPDatabase. These tables are linked to all applicable databases. The Site ID table is obtained from TCEQ and contains information concerning sampling site locations and TCEQ site identification numbers. The Metadata table contains information on tag number ranges that have been assigned to each WBPA or project as well as which tag numbers have been used. The StoretCodes table is obtained from TCEQ and contains information about parameters, parameter codes, units, and sample matrix.
      iii. A SAS application is used to produce a summary report for each WBPA. This report consists of a

rolling 10-year data set. The SAS application design is complicated with the description of the programming being beyond the scope of this document.

b. Other
   i. Formats other than those described above will be used to accommodate special water quality data sets only, with utilization of other formats extremely limited. Submission of data in other formats to the TCEQ will occur only with approval of the TCEQ CRP Project Manager, however, no such submittals are anticipated. Data which cannot be loaded into the CRPDatabase will be stored on the network indefinitely.

DATA MANAGEMENT PLAN IMPLEMENTATION

Implementation of the data management plan is an on-going process with upgrades to the process being made as better technology, software, and/or techniques are developed. At a minimum, data will be managed in accordance with the *TCEQ DMRG* (most recent version).

DATA DICTIONARY

The data dictionary (data archive) is housed on the network in electronic text files. All data that are generated by CRP funded projects will be included and maintained in the CRP data dictionary, which will be housed on the TRA network. The Data Dictionary will be maintained indefinitely in electronic format.

RECORD KEEPING AND DATA STORAGE

1. Data_Management_Record.xlsx
   a. Upon receipt of data from the data source, the TRA Quality Assurance Officer logs it in to the Data_Management_Record.xlsx table. Data received from the following sources will be assigned the corresponding entity codes:

Collecting Entity	Submitting Entity Code	Collecting Entity Code	Tag Number Prefix
Tarrant Regional Water District	TR	TD	TR
Lake Livingston Project	TR	LL	TR
City of Arlington	TR	AR	TR
City of Dallas (Collecting Entity Code DA)	TR	DA	TR
City of Dallas (Collecting Entity Code DT)	TR	DT	TR
DFW Airport EAD	TR	DF	TR
North Texas Municipal Water District	TR	NM	TR
Trinity River Authority	TR	TR	TR
City of Fort Worth	TR	FW	TR
City of Grand Prairie	TR	GP	TR
City of Irving	TR	IR	TR
City of Plano	TR	PN	TR
City of Frisco	TR	FR	TR
Upper Trinity Regional	TR	UW	TR

   b. The table contains records of the source of the data, the date of receipt, date range of the data, and notes of any data issues.
   c. Immediately after entry into Data_Management_Record.xlsx, the original data are archived.
2. UpdatedFileLogTracking
   a. Once data have been converted and quality assured, they are prepared for submittal to the SWQMIS Test Environment.
   b. Information about the submitted data files is loaded into the UpdatedFileLogTracking table.
      i. This table contains information concerning the source of data, type of data, date of receipt, format, the archive location of the original data, date range, tag number range, number of events and results, date of submittal to TCEQ.
      ii. Data files are assigned a File Name and an ID number. The File Name is used to group together similar data files and links unconverted data files with the converted data.

iii. After the data files are submitted to TCEQ, they are archived electronically.
iv. The data files are then added to the CRPDatabase.

MIGRATION, TRANSFER, AND CONVERSION

1. Migration and Transfer
    a. For migration and transfer purposes UpdatedFileLogTracking contains information concerning the location of the data file on the network, number of records, and date range. The Data-Management_Record.xlsx file contains information on the actions taken on the data files. These two tables make it possible to track data from the original data file through quality assurance to ensure that data have been faithfully transferred throughout the process.
2. Conversion
    a. The acquisition of routine data from other parties involves conversion from Excel spreadsheets. Data for special projects may be received in formats other than Excel.
    b. Conversions are performed by TRA staff or subcontractors for some special projects.
    c. Data are converted from their original formats into the TCEQ event/result format using terminology and field descriptions that are included in the DMRG (most recent version) and moved into database tables to await quality assurance and quality control.

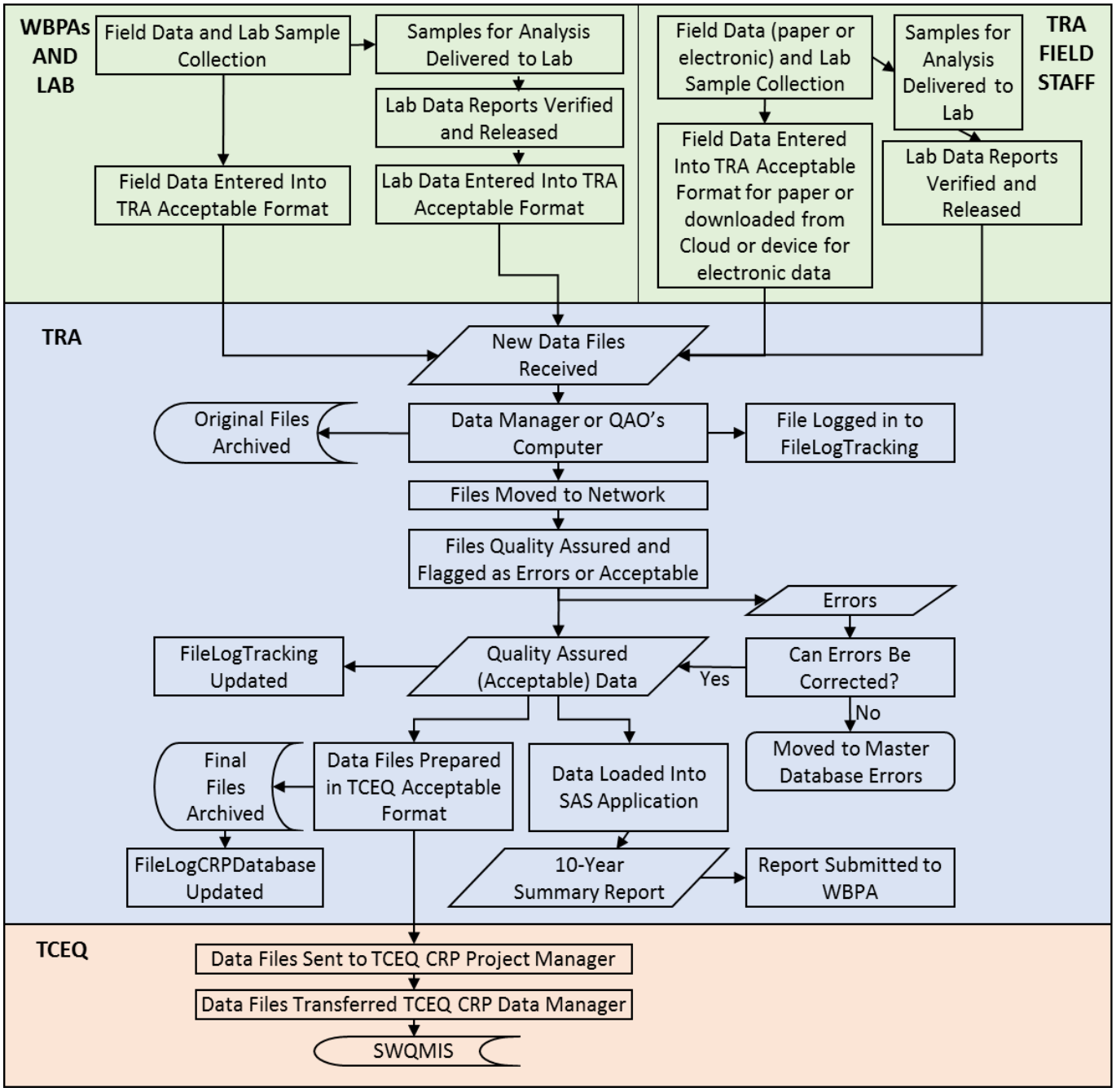
QUALITY ASSURANCE/QUALITY CONTROL (QA/QC), DATA ERRORS, AND LOSS

1. It is the policy of TRA to require that WBPAs check data post entry for inconsistencies by comparing entered data to original hard copies (lab bench sheets, etc.).
2. In some cases (special projects), post entry electronic data conversion to the required format will be accomplished via the use of subcontractors. In these cases, the responsibility of assuring that all conversions are accomplished faithfully will be with the subcontractor's project manager.
3. Once data have been entered in or converted to required format, they will be transmitted to the TRA QAO. This individual will then be responsible for verifying that data are in the appropriate format and, to the extent possible, free of errors. The QAO may also oversee the work of the Data Manager for these tasks. If errors are found, the data are sent back to the WBPA for correction. For errors found in TRA data, the field and/or lab staff are questioned to determine if the data can be corrected. Once the data set is free of errors, it will then undergo quality assurance.
4. During quality assurance, the data are subjected to a suite of formulas and pivot tables which examine records for outliers, incorrect storet codes, missing data in required fields, correct tag numbers or duplicated tag numbers, and incorrect site IDs. Only records which do not have any of the above errors are flagged as acceptable for submittal to TCEQ and loading into the CRPDatabase.
    a. Data that have been found to contain errors will be flagged to await correction.
5. Only the TRA Project Manager, Data Manager, QAO, and field staff will enter data into the CRPDatabase. These individuals will be the only individuals outside of TRA computer services who will have read/write privileges. All other users will have read only access to avoid inadvertent deletions or alterations to data.
6. A Data Review Checklist, Data Summary, and Summary of Affected Data (data loss report) will be completed for each set of data that has been through QA/QC and prepared for submittal to the TCEQ Project Manager.
7. Once the Data Review Checklist, Data Summary, and Summary of Affected Data have been completed and erroneous data have been flagged, the data that have undergone and passed QA/QC and flagged as acceptable will be converted to the TCEQ required Event/Result format and submitted to TCEQ for inclusion in SWQMIS.
8. Data that have been submitted to SWQMIS are logged into UpdatedFileLogTracking and archived.
9. Data loss is prevented by keeping detailed statistics for the Affected Data table in the Data Review Checklist. If data has been lost, it can be recovered from the archived original electronic data files.
10. The network drive that contains these files, databases, and archives are backed up on a regular basis by IT personnel.

INFORMATION DISSEMINATION

Public availability of data will be limited to completed, quality assured data. TCEQ's data viewer is linked on the TRA CRP webpage for public access to data. Public data requests are generally fulfilled by spreadsheet and sent to the requesting party via email but format and transmission method will be determined on a case-by-case basis.

DATA MANAGEMENT PROCESS



Appendix H: Data Forms and Biological Monitoring Packet

See the TCEQ *Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014* (RG-416) for instructions on completing the Biological Data Summary Packet. This packet will be used to ensure that all necessary information is collected in the field and to prepare the event/result text files for submittal to SWQMIS. In addition, portions of this packet will be used for the preparation of the BLOB files.

Aquatic Life Monitoring and Habitat Assessment Checklist

Background Information

Name of water body:			
Segment number:		Station ID:	

On segment: Yes ☐ No ☐

Permit number, if applicable:_____ Check monitoring objective: ALM ☐ ALU ☐ UAA ☐ RWA ☐

Historic Stream Characterization (circle one):

Intermittent Intermittent w/ perennial pools sufficient to support significant aquatic life use Perennial Unknown

Basis for historic stream characterization (describe): _____

Current aquatic life use designation (if classified segment or site specific standard determined):

Exceptional ☐ High ☐ Intermediate ☐ Limited ☐

Current assessment status on the (year) _____ Water Quality Inventory, 305(b) Report:

Supported ☐ Partially Supported ☐ Not Supported ☐ Concern ☐ Not Assessed ☐

Data Entry

Field data entry (FDE) information:_____ Date entered into FDE:____RTAG #:_____ (*TCEQ regional biologists only*)

Field data (*CRP partners only*): Tag #:

Data Set	Index Period Tags	Critical Period Tags
Field		
Diurnals		
Flow & Habitat		
Benthics Kicknet		
Nekton Summary		
Electrofishing		
Seining		

Objective for Aquatic Life Use Assessment

Is this water body supporting its designated uses? Yes ☐ No ☐ Reason:

Known or potential causes of aquatic life use concern or impairment: _____

Identify sources of pollution:

Point source: Yes ☐ No ☐ Identify: _____

Nonpoint source: Yes ☐ No ☐ Identify: _____

Ambient toxicity tests in water body? Yes ☐ No ☐

Results:	Sediment Chronic	Sediment Acute	Water Chronic	Water Acute
Significant effect				
No significant effect				

Monitoring Information

Biological monitoring conducted during index period (03/15 to 06/30 and 10/01 to 10/15) and critical period (07/01-09/30).
Note: If sampling event for a RWA, characterize the receiving stream upstream of the existing discharge point or downstream of the proposed discharge point.

Stream characterization event 1, date: _____

~~Dry~~	~~Pools covering _____% of the _____ meters assessed~~	Flowing at _____ cfs (measured)

Describe conditions that may have adversely affected stream during each sampling event (for example, recent rains, drought, construction): _____

Stream characterization event 2, date:_____

~~Dry~~	~~Pools covering _____% of the _____ meters assessed~~	Flowing at _____ cfs (measured)

Describe conditions that may have adversely affected stream during each sampling event (for example, recent rains, drought, construction): _____

Nekton sampling event 1:

Minimum 15–minute (900 seconds) electrofishing: Yes ☐ No ☐

Minimum 6 seine hauls (or equivalent effort to sample 60 meters): Yes ☐ No ☐

Fish sampling conducted in all available habitat types: Yes ☐ No ☐

If no, please describe why:

Benthic macroinvertebrate sampling event 1:

Indicate method(s) used: Rapid bioassessment: 5–minute kicknet ☐ snags ☐ Quantitative: Surber ☐ snags ☐ dredge ☐

Habitat assessment event 1:

TCEQ habitat protocols: Yes ☐ No ☐

Stream flow measurement event 1:

Instantaneous measurement: Yes ☐ No ☐ USGS gauge reading: Yes ☐ No ☐

Nekton sampling event 2:

Minimum 15–minute (900 seconds) electrofishing: Yes ☐ No ☐

Minimum 6 seine hauls (or equivalent effort to sample 60 meters): Yes ☐ No ☐

Fish sampling conducted in all available habitat types: Yes ☐ No ☐

If no, please describe why:

Benthic macroinvertebrate sampling event 2:

Indicate method(s) used: Rapid bioassessment: 5–minute kicknet ☐ snags ☐ Quantitative: Surber ☐ snags ☐ dredge ☐

Habitat assessment event 2:

TCEQ habitat protocols: Yes ☐ No ☐

If no, flow, wetted channel width, photographs, description of bank conditions relative to first event, and description of canopy cover conditions relative to first event must be provided in this packet.

Stream flow measurement event 2:

Instantaneous measurement: Yes ☐ No ☐ USGS gauge reading: Yes ☐ No ☐

Assessment Results (Optional)

Fish community index event 1:

Exceptional ☐ High ☐ Intermediate ☐ Limited ☐

Fish community critical event 2:

Exceptional ☐ High ☐ Intermediate ☐ Limited ☐

Benthic macroinvertebrate community index event 1:

Exceptional ☐ High ☐ Intermediate ☐ Limited ☐

Benthic macroinvertebrate community critical event 2:

Exceptional ☐ High ☐ Intermediate ☐ Limited ☐

Habitat index event 1:

Exceptional ☐ High ☐ Intermediate ☐ Limited ☐

Habitat index critical 2:

Exceptional ☐ High ☐ Intermediate ☐ Limited ☐

TRA BIOLOGICAL FIELD DATA REPORTING FORM

Tag No:	Placeholder				
Station:	0	Sample(s) Collected By:			
Segment:	0	Region:	0	Ecoregion:	0
Date:	1/0/1900	Time:			

GRAB SAMPLE

Secchi Depth (m):		Flow (cfs):	0
Flow Measurement Method:	0		
Flow Severity (1=No Flow, 2=Low, 3=Normal, 4=Flood, 5=High, 6=Dry):			
Air Temperature(°C):			
Days Since Last Rain:			
Wind Intensity (1=Calm, 2=Slight, 3=Moderate, 4=Strong):			
Present Weather (1=Clear, 2=Partly Cloudy, 3=Cloudy, 4=Rain, 5=Other):			
Water Column Depth (m):			
Sample Depth (m):			
Water Temperature (°C):			
pH (SU):			
Sp Cond (uS/cm):			
DO (mg/L):			

DROUGHT PARAMETERS

Max Pool Width (m):	NA
Max Pool Depth (m):	NA
Pool Length (m):	NA
% Pool Coverage in 500 Meter Reach:	NA

OBSERVATIONS

24-HOUR DATA

Start Date:	1/0/1900	End Date:	Date	Category:	T
Start Time:	12:00:00 AM	End Time:	Time	Type:	0
Start Depth:	0	End Depth:	0	Tag #:	Placeholder

	Water Temp	DO	Sp Cond	pH
Minimum:	0	0	0	0
Average:	#DIV/0!	#DIV/0!	#DIV/0!	NA
Maximum:	0	0	0	0
Count:	0	0	0	0

Stream Flow (Discharge) Measurement Form

Stream Flow (Discharge) Measurement Form

Stream: 0		Date: 1/0/1900	
Station: 0	Time Begin:		Time End:
Description: 0			
Observers:	Stream Width:		Section Width (ft) (W):
Flow Measurement Method (enter number only):			
(1=Gage, 2=Electric, 3=Mechanical, 4=Weir/flume, 5-Doppler)			

Section Midpoint (ft)	Section Depth (ft) (D)	Observational Depth (ft)	Velocity (V) At point (ft/s)	Velocity (V) Average (ft/s)	Flow (Q)
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
		0		0	0
				Total Q	0

Discharge Measurement Summary

Date Generated: Thu Mar 6 2014

File Information

File Name	SOUTH.C2.WAD
Start Date and Time	2013/11/19 12:20:29

Site Details

Site Name	TOWN CREEK
Operator(s)	KM AK

System Information

Sensor Type	FlowTracker
Serial #	P4853
CPU Firmware Version	3.9
Software Ver	2.30
Mounting Correction	0.0%

Units (English Units)

Distance	ft
Velocity	ft/s
Area	ft^2
Discharge	cfs

Discharge Uncertainty

Category	ISO	Stats
Accuracy	1.0%	1.0%
Depth	0.2%	2.4%
Velocity	0.7%	3.0%
Width	0.1%	0.1%
Method	1.8%	-
# Stations	1.9%	-
Overall	**2.9%**	**4.0%**

Summary

Averaging Int.	40	# Stations	27
Start Edge	LEW	Total Width	18.750
Mean SNR	27.2 dB	Total Area	21.062
Mean Temp	61.19 °F	Mean Depth	1.123
Disch. Equation	Mid-Section	Mean Velocity	0.4213
		Total Discharge	**8.8740**

Measurement Results

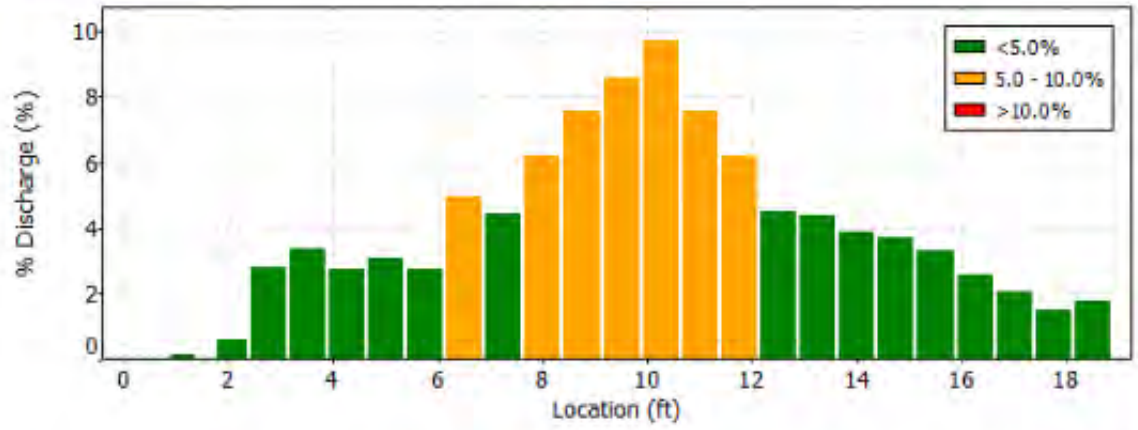
St	Clock	Loc	Method	Depth	%Dep	MeasD	Vel	CorrFact	MeanV	Area	Flow	%Q
0	12:20	0.50	None	0.250	0.0	0.0	0.0000	1.00	0.0669	0.094	0.0063	0.1
1	*12:22*	*1.25*	*0.6*	*0.600*	*0.6*	*0.240*	*0.0669*	*1.00*	*0.0669*	*0.300*	*0.0201*	*0.2*
2	*12:20*	*1.50*	*0.6*	*0.250*	*0.6*	*0.100*	*0.0033*	*1.00*	*0.0033*	*0.094*	*0.0003*	*0.0*
3	*12:25*	*2.00*	*0.6*	*1.000*	*0.6*	*0.400*	*0.0965*	*1.00*	*0.0965*	*0.625*	*0.0603*	*0.7*
4	12:27	2.75	0.6	1.200	0.6	0.480	0.2802	1.00	0.2802	0.900	0.2522	2.8
5	12:28	3.50	0.6	1.550	0.6	0.620	0.2605	1.00	0.2605	1.162	0.3028	3.4
6	*12:30*	*4.25*	*0.6*	*2.000*	*0.6*	*0.800*	*0.1677*	*1.00*	*0.1677*	*1.500*	*0.2515*	*2.8*
7	*12:32*	*5.00*	*0.6*	*2.100*	*0.6*	*0.840*	*0.1775*	*1.00*	*0.1775*	*1.575*	*0.2796*	*3.2*
8	12:33	5.75	0.6	2.000	0.6	0.800	0.1647	1.00	0.1647	1.500	0.2470	2.8
9	12:34	6.50	0.6	1.900	0.6	0.760	0.3130	1.00	0.3130	1.425	0.4460	5.0
10	12:35	7.25	0.6	1.800	0.6	0.720	0.2976	1.00	0.2976	1.350	0.4017	4.5
11	12:36	8.00	0.6	1.650	0.6	0.660	0.4491	1.00	0.4491	1.237	0.5558	6.3
12	12:38	8.75	0.6	1.550	0.6	0.620	0.5843	1.00	0.5843	1.162	0.6792	7.7
13	12:39	9.50	0.6	1.400	0.6	0.560	0.7287	1.00	0.7287	1.050	0.7651	8.6
14	12:40	10.25	0.6	1.400	0.6	0.560	0.8278	1.00	0.8278	1.050	0.8691	9.8
15	12:41	11.00	0.6	1.400	0.6	0.560	0.6460	1.00	0.6460	1.050	0.6783	7.6
16	12:42	11.75	0.6	1.100	0.6	0.440	0.6736	1.00	0.6736	0.825	0.5557	6.3
17	12:43	12.50	0.6	0.950	0.6	0.380	0.5669	1.00	0.5669	0.713	0.4040	4.6
18	12:44	13.25	0.6	0.850	0.6	0.340	0.6181	1.00	0.6181	0.638	0.3941	4.4
19	12:45	14.00	0.6	0.750	0.6	0.300	0.6191	1.00	0.6191	0.563	0.3482	3.9
20	12:46	14.75	0.6	0.650	0.6	0.260	0.6827	1.00	0.6827	0.487	0.3328	3.8
21	12:47	15.50	0.6	0.600	0.6	0.240	0.6683	1.00	0.6683	0.450	0.3008	3.4
22	12:48	16.25	0.6	0.550	0.6	0.220	0.5650	1.00	0.5650	0.412	0.2330	2.6
23	12:49	17.00	0.6	0.450	0.6	0.180	0.5577	1.00	0.5577	0.338	0.1883	2.1
24	*12:50*	*17.75*	*0.6*	*0.400*	*0.6*	*0.160*	*0.4685*	*1.00*	*0.4685*	*0.300*	*0.1405*	*1.6*
25	*12:54*	*18.50*	*0.6*	*0.350*	*0.6*	*0.140*	*-0.6148*	*-1.00*	*0.6148*	*0.263*	*0.1614*	*1.8*
26	12:54	19.25	None	0.000	0.0	0.0	0.0000	1.00	0.0000	0.000	0.0000	0.0

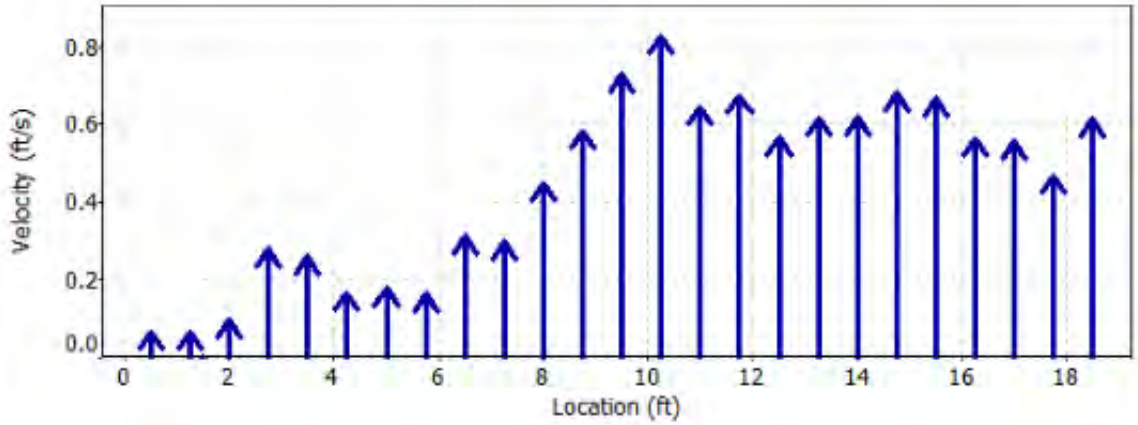
Rows in italics indicate a QC warning. See the Quality Control page of this report for more information.

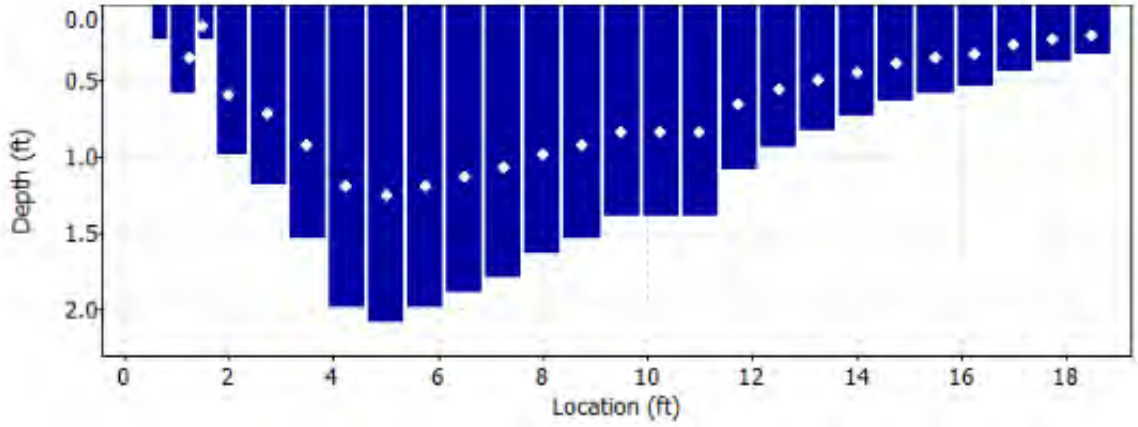
Discharge Measurement Summary

Date Generated: Thu Mar 6 2014

File Information		Site Details	
File Name	SOUTH.C2.WAD	Site Name	TOWN CREEK
Start Date and Time	2013/11/19 12:20:29	Operator(s)	KM AK







Discharge Measurement Summary

Date Generated: Thu Mar 6 2014

File Information

File Name	SOUTH.C2.WAD
Start Date and Time	2013/11/19 12:20:29

Site Details

Site Name	TOWN CREEK
Operator(s)	KM AK

Quality Control

St	Loc	%Dep	Message
1	1.25	0.6	SNR (42.5) is different from typical SNR (27.2)
2	1.50	0.6	SNR (47.0) is different from typical SNR (27.2)
		0.6	Boundary QC is Good; possible boundary interference
3	2.00	0.6	High angle: 35
6	4.25	0.6	High angle: 23
7	5.00	0.6	High angle: 23
24	17.75	0.6	Boundary QC is Poor; possible boundary interference
25	18.50	0.6	High angle: -180

Habitat Data Reporting Form

PERIOD - Habitat Data Reporting Form

Tag#:	Placeholder	Region:	0	Email:	0		
Station ID:	0	Segment:	0	Data Source:	0	0	0

Station Description: 0

Composite - habitat events will be Both

COMPOSITE SAMPLE

B	COMPOSITE CATEGORY : T=Time S=Space B=Both		
01/00/1900	0:00	0.00	M
START DATE (MM/DD/YYYY)	START TIME (HH:MM)	START DEPTH (SHALLOWEST)	M=meters F=feet
01/00/1900	0:00	0	M
END DATE (MM/DD/YYYY)	END TIME (HH:MM)	END DEPTH (DEEPEST)	M=meters F=feet

HABITAT DESCRIPTORS

NOTE: All measurements reported in metric units

72051	#DIV/0!	Streambed slope over evaluated reach (m/km)	89844		Dominant substrate type (1=clay, 2-silt, 3=sand, 4=gravel, 5=cobble, 6=boulder, 7=bedrock, 8=other)
89859	0	Approximate drainage area above the most downstream transect from USGS map (km^2)	89845	0.00	Average % of substrate gravel size (> 2mm) or larger (%)
89884	0	Reach length of stream evaluated (m)	84159	0.00	Average % instream cover (%)
89832	0	Number of lateral transects that were made	89929	0	Number of Stream Cover Types
89861	0.00	Average stream width (m)	89846	0.00	Average % stream bank erosion potential (%)
89862	0	Average stream depth (m)	89847	0.00	Average stream bank angle (degrees)
00061	0	Instantaneous stream flow (ft^3/sec)	89866	0.00	Average width of natural riparian vegetation (m)
89835	0	Indicate flow measurement method 1=Flow Gage Station, 2= Electronic, 3=Mechanical, 4=Weir/Flume, 5=Doppler	89849	0.00	Average % trees as riparian vegetation, over reach (%)
89848		Channel Flow Status 1=no flow, 2=low, 3=moderate, 4=high	89850	0.00	Average % shrubs as riparian vegetation, over reach (%)
89864	0	Maximum pool width at time of study (m)	89851	0.00	Average % grasses & forbes as riparian vegetation, over reach (%)
89865	0	Maximum pool depth in study area (m)	89852	0.00	Average % cultivated fields as riparian vegetation, over reach (%)
89839	0	Total number of stream bends	89853	0.00	Average % other as riparian vegetation, over reach (%)
89840	0	Number of well-defined stream	89854	#DIV/0!	Average % tree canopy coverage (%)
89841	0	Number of moderately defined stream bends	89867		Aesthetics (1=wilderness, 2=natural, 3=common, 4=offensive)
89842	0	Number of poorly defined stream bends	84161	0	Stream Order
89843	0	Total number of riffles	89961	0	Ecoregion (Texas Ecoregion Code)
89910*	NA	Largest pool max depth (m)	89962		Land Development Impact (1=unimpacted, 2=low, 3=moderate, 4=high)
89908*	NA	Largest pool max width (m)	89911*	NA	Smallest pool max depth (m)
89909*	NA	Largest pool max length (m)	89912*	NA	Smallest pool max width (m)
89914*	NA	# perennial pools evaluated	89913*	NA	Smallest pool max length (m)

*Specific to no flow with isolated pools, leave "NA" if isolated pools are not present at time of sampling

Page 1 of 3	PERIOD - Part I - Stream Physical Characteristics Worksheet			
Observers: 0		Date: 01/00/1900	Time: 0:00 to 0:00	
Weather conditions: 0				
Stream: 0		Stream segment #: 0		
Location of site: 0 0			Length of reach (m): 0	
Observed stream uses: 0				
Stream type (perennial, intermittent w/ perennial pools, intermittent, unknown): 0				
Stream bends:	No. well defined 0	No. moderately defined 0	No. poorly defined 0	
Aesthetics (wilderness, natural, common, or offensive): 0			No. of riffles: 0	
Anthropomorphic Channel obstructions or modifications: 0				
Channel flow status (high, moderate, low, no flow): 0				
Land development impact (none, low, moderate, high): 0				

Riparian vegetation (%):	Left Bank	Right Bank	Maximum Pool Depth (m): 0
Trees	0.00	0.00	Maximum Pool Width (m): 0
Shrubs	0.00	0.00	Notes: Reach comments, # of inlets/seeps, etc...
Grasses or forbs	0.00	0.00	0
Cultivated fields	0.00	0.00	
Other (bare, roots, etc)	0.00	0.00	

Site Map: Draw or label a detailed Google Earth Map

PERIOD - Part 1 - Stream Physical Characteristics Worksheet (continued)

Page 2 of 3 Date: 01/00/1900 Stream Name: 0

Location of transect	Stream width (m)	Left bank slope (°)	Left bank erosion potential (%)	Thalweg Depth (m): 0.00	Right bank slope (°)	Right bank erosion potential (%)
T1	0.00	0.00	0.00	LB — Stream Depths (m) at Points Across Transect — RB	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Habitat type	0	Dominant substrate type	0	Riparian vegetation %	Left Bank / Right Bank
Macrophytes	0			Trees	0 / 0
Algae	0			Shrubs	0 / 0
Width of natural buffer vegetation (m)		Dominant instream cover type		Grasses/Forbs	0 / 0
LB: 0.00	RB: 0.00	0		Cultivated Fields	0 / 0
				Other (Bare, roots, etc)	0 / 0

% Gravel or larger	Tree canopy (%)	
0.00	Total	#DIV/0!
	LB	0
% Instream cover	CL	0
0.00	CR	0
	RB	0

Instream cover types: 0

Notes: 0

Location of transect	Stream width (m)	Left bank slope (°)	Left bank erosion potential (%)	Thalweg Depth (m): 0.00	Right bank slope (°)	Right bank erosion potential (%)
T2	0.00	0.00	0.00	LB — Stream Depths (m) at Points Across Transect — RB	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Habitat type	0	Dominant substrate type	0	Riparian vegetation %	Left Bank / Right Bank
Macrophytes	0			Trees	0 / 0
Algae	0			Shrubs	0 / 0
Width of natural buffer vegetation (m)		Dominant instream cover type		Grasses/Forbs	0 / 0
LB: 0.00	RB: 0.00	0		Cultivated Fields	0 / 0
				Other (Bare, roots, etc)	0 / 0

% Gravel or larger	Tree canopy (%)	
0.00	Total	#DIV/0!
	LB	0
% Instream cover	CL	0
0.00	CR	0
	RB	0

Instream cover types: 0

Notes: 0

Location of transect	Stream width (m)	Left bank slope (°)	Left bank erosion potential (%)	Thalweg Depth (m): 0.00	Right bank slope (°)	Right bank erosion potential (%)
T3	0.00	0.00	0.00	LB — Stream Depths (m) at Points Across Transect — RB	0.00	0.00

0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Habitat type	0	Dominant substrate type	0	Riparian vegetation %	Left Bank / Right Bank
Macrophytes	0			Trees	0 / 0
Algae	0			Shrubs	0 / 0
Width of natural buffer vegetation (m)		Dominant instream cover type		Grasses/Forbs	0 / 0
LB: 0.00	RB: 0.00	0		Cultivated Fields	0 / 0
				Other (Bare, roots, etc)	0 / 0

% Gravel or larger	Tree canopy (%)	
0.00	Total	#DIV/0!
	LB	0
% Instream cover	CL	0
0.00	CR	0
	RB	0

Instream cover types: 0

Notes: 0

PERIOD - Part 1 - Stream Physical Characteristics Worksheet (continued)

Page 3 of 3 Date: 01/00/1900 Stream Name: 0

T4

Location of transect	Stream width (m)	Left bank slope (°)	Left bank erosion potential (%)
T4	0.00	0.00	0.00

Thalweg Depth (m): 0.00

Stream Depths (m) at Points Across Transect										
LB										RB
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Right bank slope (°)	Right bank erosion potential (%)
0.00	0.00

Habitat type	0
Macrophytes	0
Algae	0

Dominant substrate type: 0

Riparian vegetation %	Left Bank	Right Bank
Trees	0	0
Shrubs	0	0
Grasses/Forbs	0	0
Cultivated Fields	0	0
Other (Bare, roots, etc)	0	0

% Gravel or larger: 0.00

Tree canopy (%)

Total	#DIV/0!
LB	0
CL	0
CR	0
RB	0

Width of natural buffer vegetation (m)

LB:	RB:
0.00	0.00

Dominant instream cover type: 0

% Instream cover: 0.00

Instream cover types: 0

Notes: 0

T5

Location of transect	Stream width (m)	Left bank slope (°)	Left bank erosion potential (%)
T5	0.00	0.00	0.00

Thalweg Depth (m): 0.00

Stream Depths (m) at Points Across Transect										
LB										RB
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Right bank slope (°)	Right bank erosion potential (%)
0.00	0.00

Habitat type	0
Macrophytes	0
Algae	0

Dominant substrate type: 0

Riparian vegetation %	Left Bank	Right Bank
Trees	0	0
Shrubs	0	0
Grasses/Forbs	0	0
Cultivated Fields	0	0
Other (Bare, roots, etc)	0	0

% Gravel or larger: 0.00

Tree canopy (%)

Total	#DIV/0!
LB	0
CL	0
CR	0
RB	0

Width of natural buffer vegetation (m)

LB:	RB:
0.00	0.00

Dominant instream cover type: 0

% Instream cover: 0.00

Instream cover types: 0

Notes: 0

T6

Location of transect	Stream width (m)	Left bank slope (°)	Left bank erosion potential (%)
T6			

Thalweg Depth (m):

Stream Depths (m) at Points Across Transect										
LB										RB

Right bank slope (°)	Right bank erosion potential (%)

Habitat type	
Macrophytes	
Algae	

Dominant substrate type

Riparian vegetation %	Left Bank	Right Bank
Trees		
Shrubs		
Grasses/Forbs		
Cultivated Fields		
Other (Bare, roots, etc)		

% Gravel or larger

Tree canopy (%)

Total	
LB	
CL	
CR	
RB	

Width of natural buffer vegetation (m)

LB:	RB:

Dominant instream cover type

% Instream cover

Instream cover types:

Notes:

PERIOD - Habitat Assessment Worksheet B Part II of III

Part II - Summary of Physical Characteristics of Water Body Using information from all of the transects and measurements in Part I and other sources, report the following general characteristics or averages for the entire reach:			
Stream Name	0	**Date**	01/00/1900
Physical Characteristics		**Value**	
Stream bed slope over evaluated reach (m/km)		#DIV/0!	
Approximate drainage area above the transect furthest downstream (from USGS or county highway map in km^2)		0	
Stream order		0	
Length of stream evaluated (in meters or kilometers)		0	
Number of lateral transects made		0	
Average stream width (in meters)		0.00	
Average stream depth (in meters)		0.00	
Instantaneous stream flow (in ft^3/sec)		0	
Indicate flow measurement method		0	
Channel flow status (high, moderate, low, or no flow)		0	
Maximum pool width (in meters)		0	
Maximum pool depth (in meters)		0	
Total number of stream bends		0	
Number of well-defined bends		0	
Number of moderately defined bends		0	
Number of poorly defined bends		0	
Total number of riffles		0	
Dominant substrate type		0	
Average percent of substrate gravel sized or larger		0.00	
Average percent instream cover		0.00	
Number of stream cover types		0	
Average percent stream bank erosion potential		0.00	
Average stream bank slope (in degrees)		0.00	
Average width of natural buffer vegetation (in meters)		0.00	
Average riparian vegetation percent composition by: (total to equal 100%)			
Trees		0.00	
Shrubs		0.00	
Grasses and Forbs		0.00	
Cultivated fields		0.00	
Other		0.00	
Average percent tree canopy coverage		#DIV/0!	
Overall aesthetic appraisal of the stream		0	

PERIOD - Habitat Assessment Worksheet B Part III of III

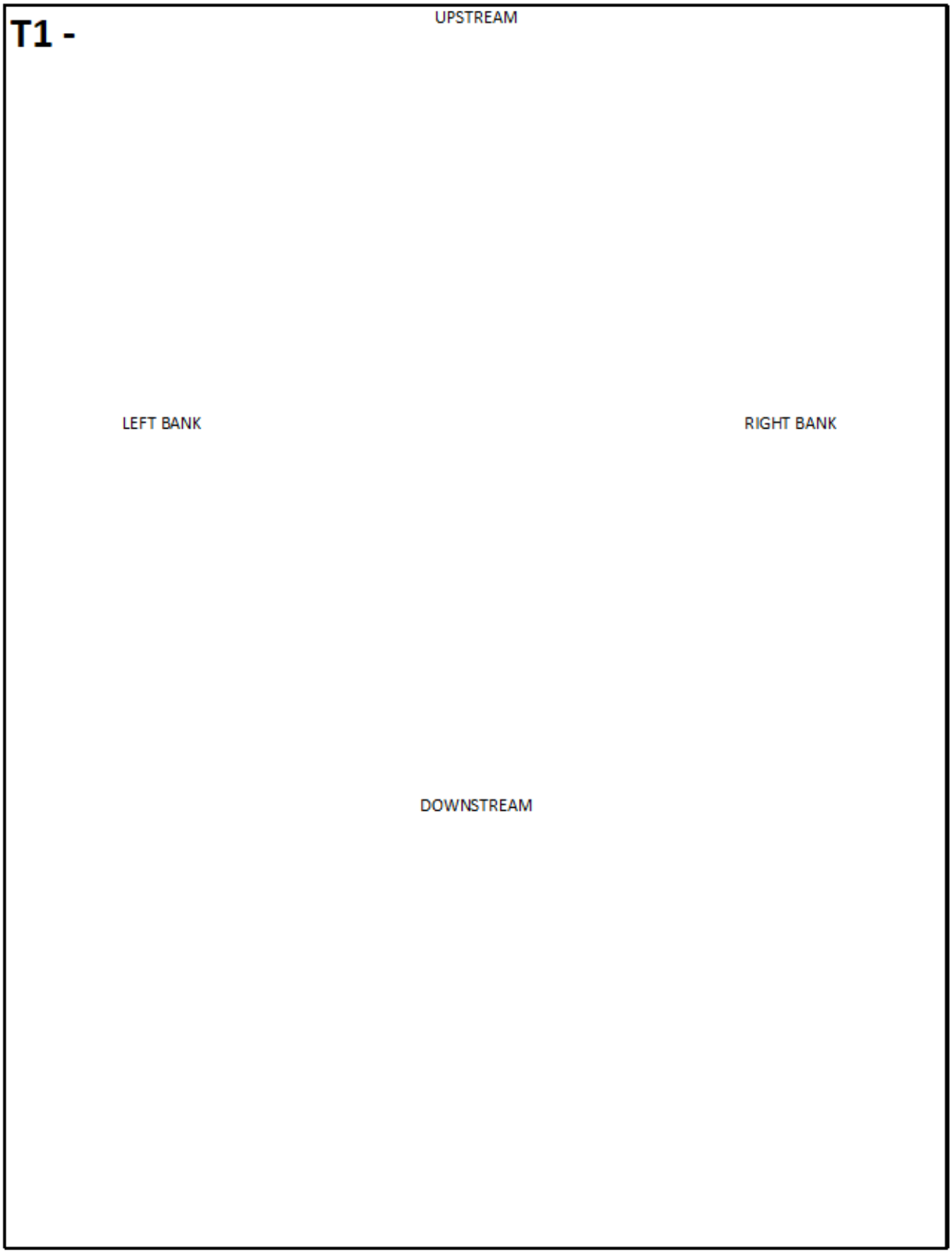
Part III - Habitat Quality Index

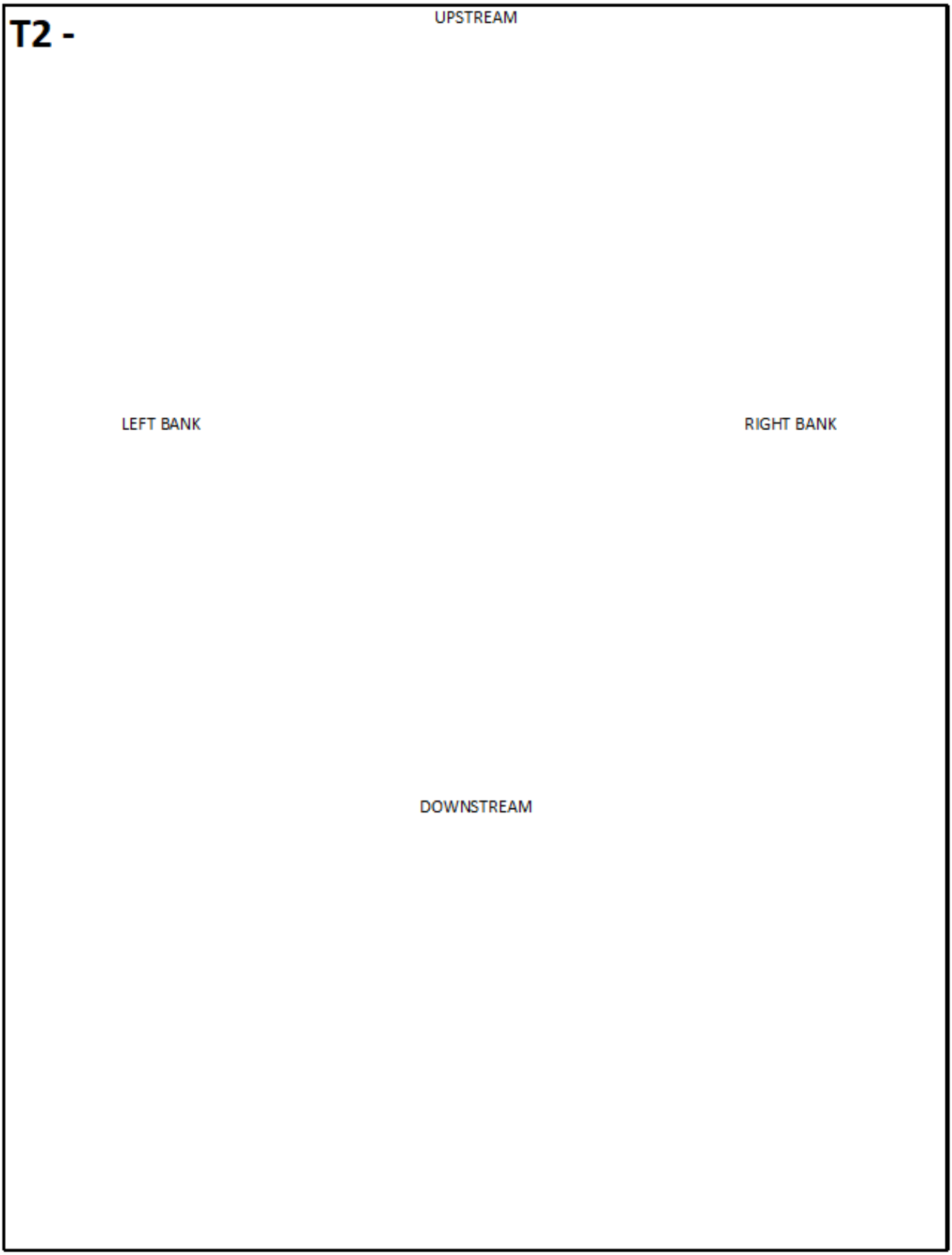
Habitat Parameter	Score	Scoring Category		
Available Instream Cover	4	Abundant	>50% of substrate favorable for colonization and fish cover; good mix of several stable (not new fall or transient) cover types such as snags, cobble, undercut banks, macrophytes	
	3	Common	30-50% of substrate supports stable habitat; adequate habitat for maintenance of populations; may be limited in the number of different habitat types	
	2	Rare	10-29.9% of substrate supports stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed	
Score	1	Absent	<10% of substrate supports stable habitat; lack of habitat is obvious; substrate unstable or lacking	
Bottom Substrate Stability	4	Stable	>50% gravel or larger substrate; gravel, cobble, boulders; dominant substrate type is gravel or larger	
	3	Moderately Stable	30-50% gravel or larger substrate; dominant substrate type is mix of gravel with some finer sediments	
	2	Moderately Unstable	10-29.9% gravel or larger substrate; dominant substrate type is finer than gravel, but may still be a mix of sizes	
Score	1	Unstable	<10% gravel or larger substrate; substrate is uniform sand, silt, clay or bedrock	
Number of Riffles	4	Abundant	> 5 riffles	To be counted, riffles must extend >50% the width of the channel and be at least as long as the channel width
	3	Common	2-4 riffles	
	2	Rare	1 riffle	
Score	1	Absent	No riffles	
Dimensions of Largest Pool Score	4	Large	Pool covers more than 50% of the channel width; maximum depth is > 1 meter	
	3	Moderate	Pool covers approximately 50% or slightly less of the channel width; maximum depth is 0.5-1 meter	
	2	Small	Pool covers approximately 25% of the channel width; maximum depth is <0.5 meter	
	1	Absent	No existing pools; only shallow auxiliary pockets	
Channel Flow Status	3	High	Water reaches the base of both lower banks; < 5% of channel substrate is exposed	
	2	Moderate	Water fills >75% of the channel; or <25% of channel substrate is exposed	
	1	Low	Water fills 25-75% of the available channel and/or riffle substrates are mostly exposed	
Score	0	No Flow	Very little water in the channel and mostly present in standing pools; or stream is dry	
Bank Stability	3	Stable	Little evidence (<10%) of erosion or bank failure; bank angles average <30°	
	2	Moderately Stable	Some evidence (10-29.9%) of erosion or bank failure; small areas of erosion mostly healed over; bank angles average 30-39.9°	
	1	Moderately Unstable	Evidence of erosion or bank failure is common (30-50%); high potential of erosion during flooding; bank angles average 40-60°	
Score	0	Unstable	Large and frequent evidence (>50%) of erosion or bank failure; raw areas frequent along steep banks; bank angles average >60°	
Channel Sinuosity	3	High	> 2 well-defined bends with deep outside areas (cut banks) and shallow inside areas (point bars) present	
	2	Moderate	1 well-defined bend or > 3 moderately-defined bends present	
	1	Low	<3 moderately-defined bends or only poorly-defined bends present	
Score	0	None	Straight channel; may be channelized	
Riparian Buffer Vegetation Score	3	Extensive	Width of natural buffer is >20 meters	
	2	Wide	Width of natural buffer is 10.1-20 meters	
	1	Moderate	Width of natural buffer is 5-10 meters	
	0	Narrow	Width of natural buffer is <5 meters	
Aesthetics of Reach	3	Wilderness	Outstanding natural beauty; usually wooded or unpastured area; water clarity is usually exceptional	
	2	Natural Area	Trees and/or native vegetation are common; some development evident (from fields, pastures, dwellings); water clarity may be slightly turbid	
	1	Common Setting	Not offensive; area is developed, but uncluttered such as in an urban park; water clarity may be turbid or discolored	
Score	0	Offensive	Stream does not enhance the aesthetics of the area; cluttered; highly developed; may be a dumping area; water clarity is usually turbid or discolored	

0 Total Score

26 - 31 Exceptional
20 - 25 High
14 - 19 Intermediate
≤ 13 Limited

HABITAT QUALITY INDEX


T1 -
UPSTREAM
LEFT BANK
RIGHT BANK
DOWNSTREAM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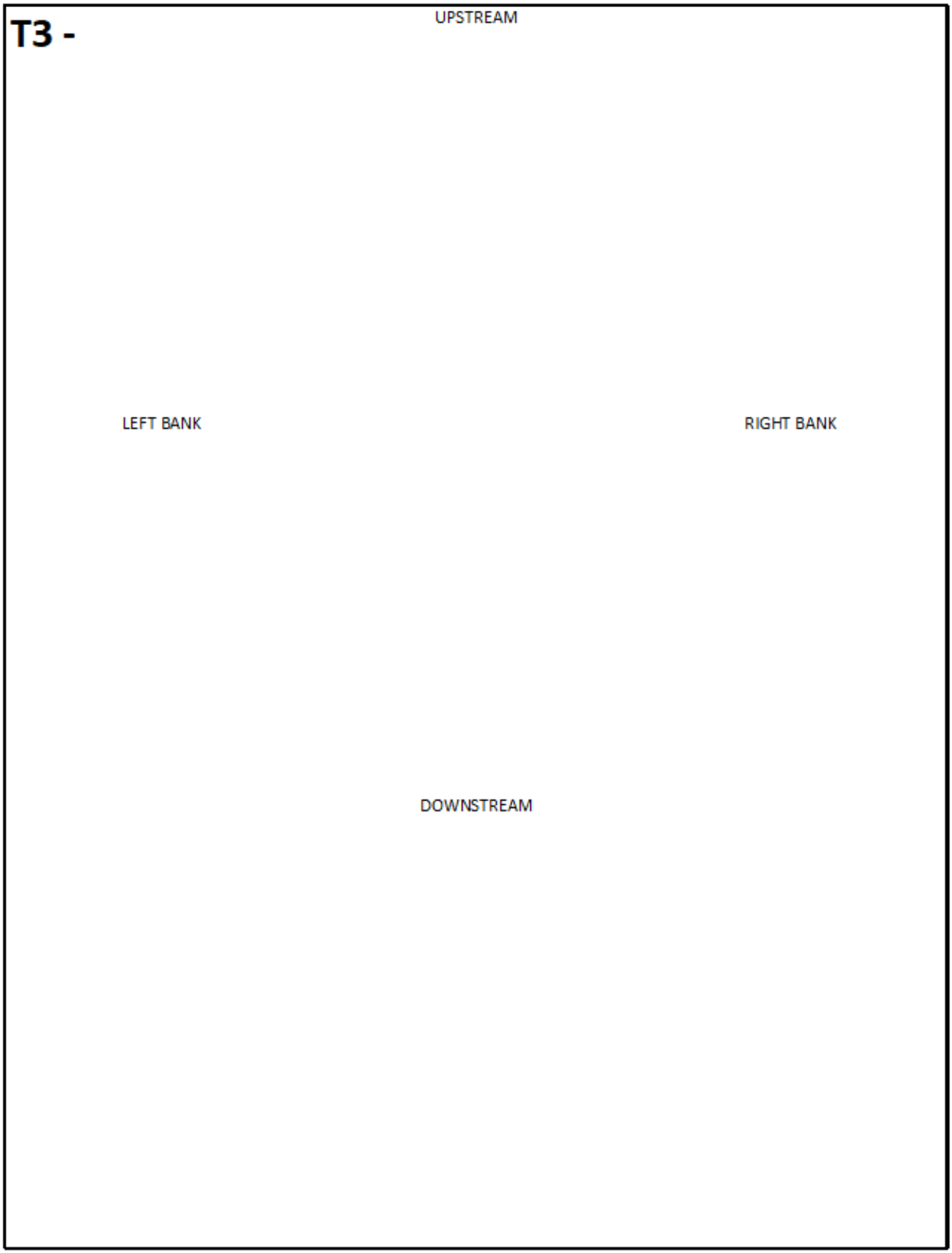
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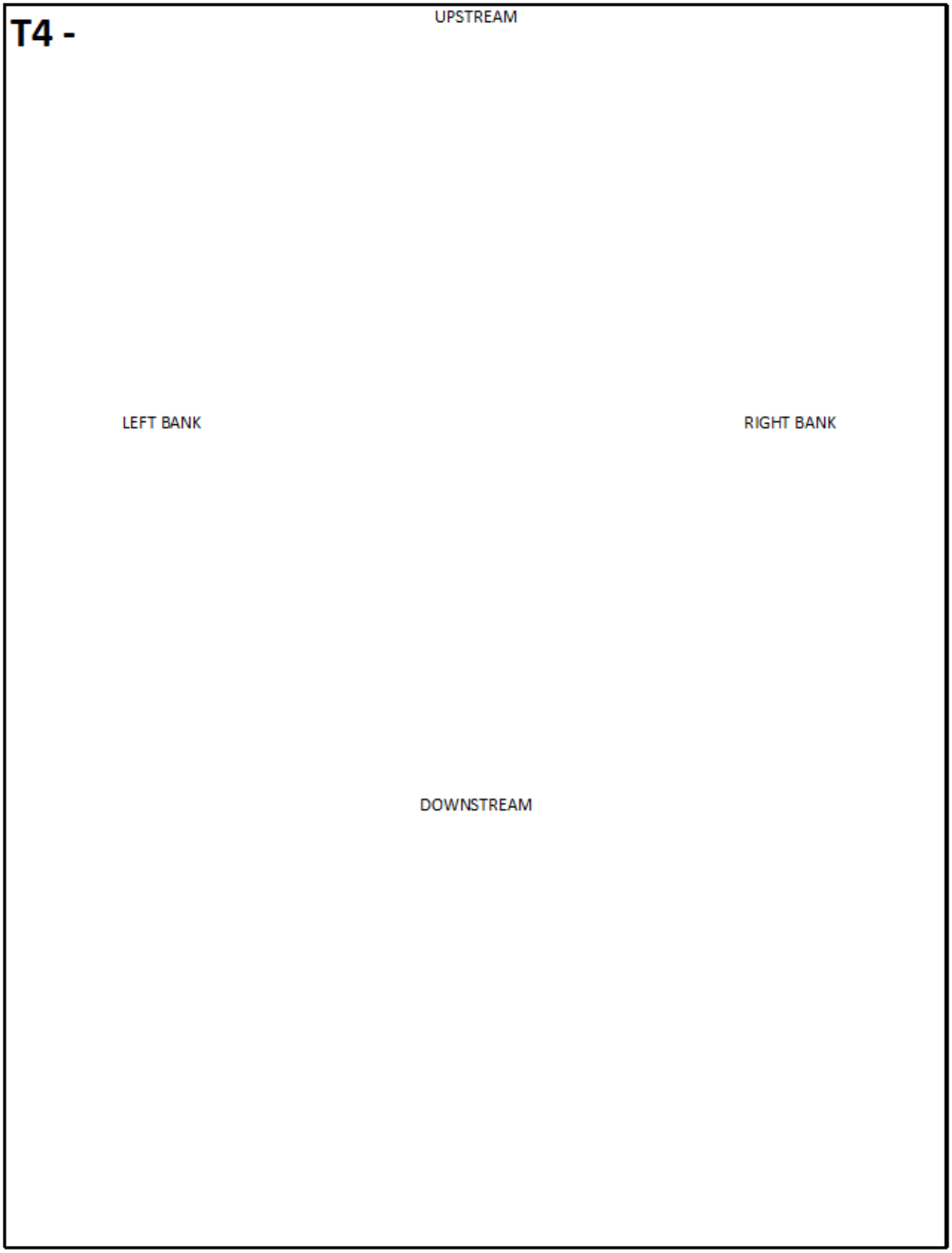
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LEFT BANK
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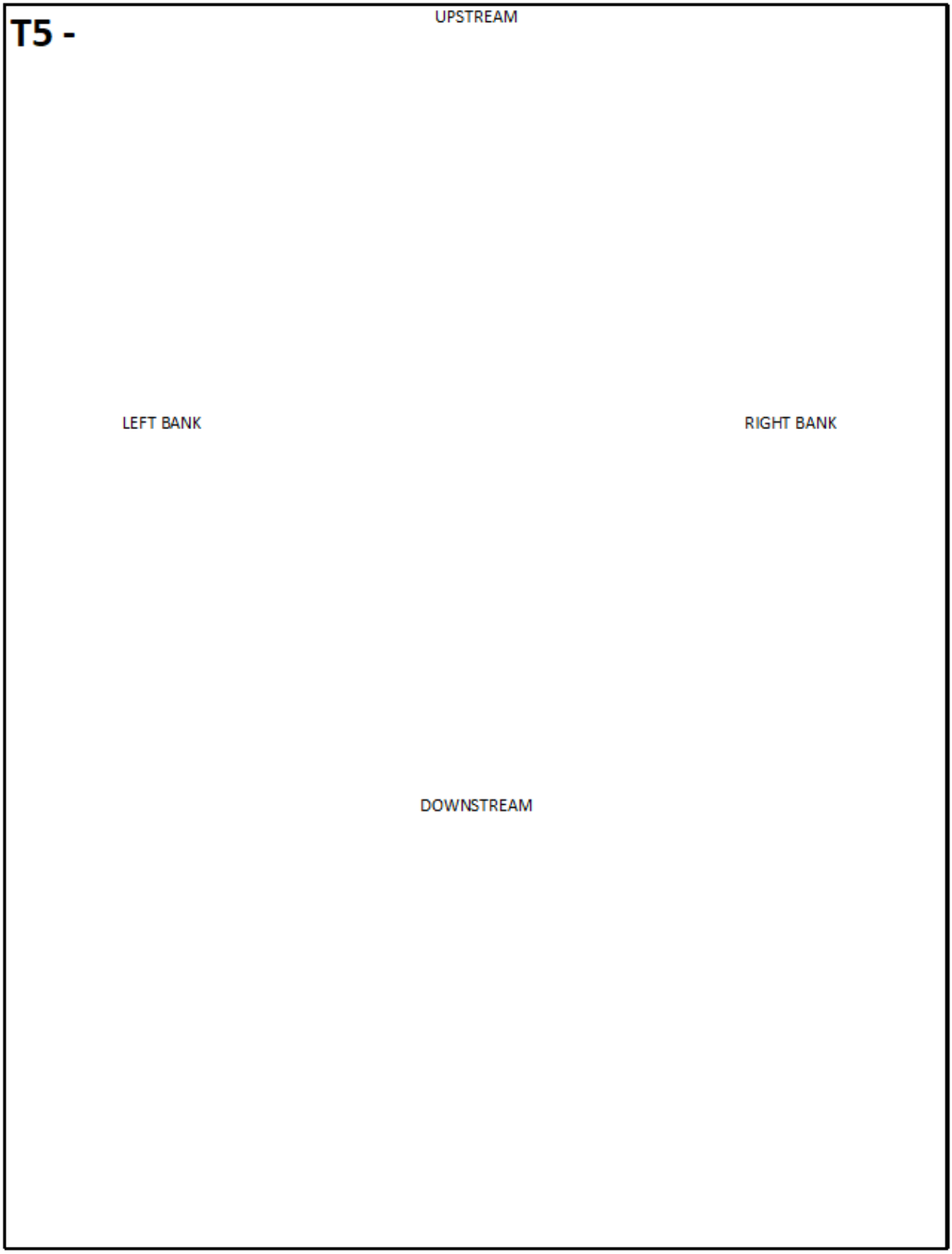
DOWNSTREAM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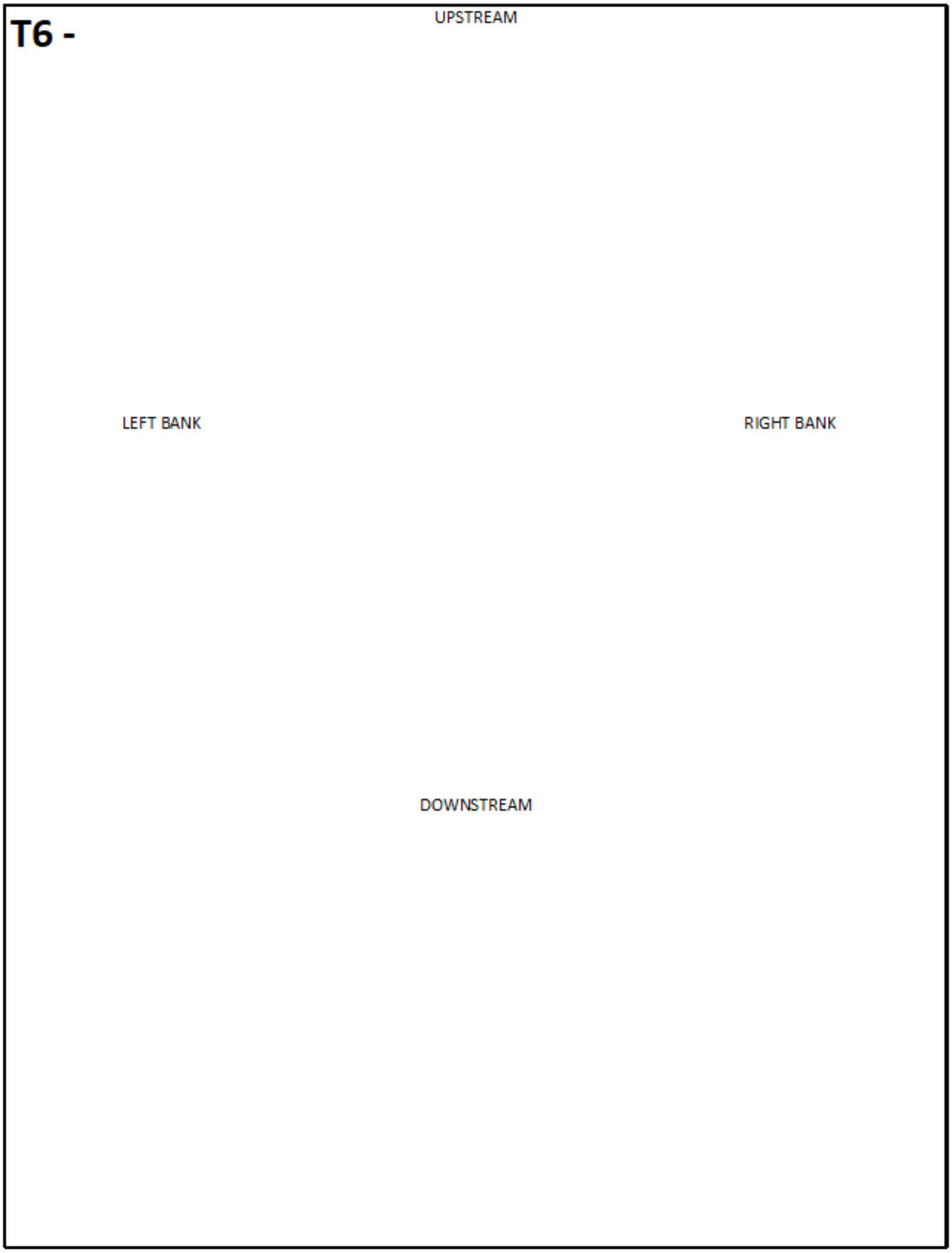
LEFT BANK
RIGHT BANK
DOWNSTREAM


T6 -
UPSTREAM
LEFT BANK
RIGHT BANK
DOWNSTREAM

Benthic Macroinvertebrate Data Reporting Form

PERIOD - Benthic Macroinvertebrate Data Reporting Form

Tag#: Placeholder | Region: 0 | Email: 0

Station ID: 0 | Segment: 0 | Data Source: 0 | 0 | 0

Station Description: 0

Composite - Most biological samples will be: Both

COMPOSITE SAMPLE

B	COMPOSITE CATEGORY :	T=Time	S=Space	B=Both

01/00/1900	0:00	0.00	M
START DATE (MM/DD/YYYY)	START TIME (HH:MM)	START DEPTH (SHALLOWEST)	M=meters F=feet
01/00/1900	**0:00**	**0**	**M**
END DATE (MM/DD/YYYY)	END TIME (HH:MM)	END DEPTH (DEEPEST)	M=meters F=feet

PARAMETRIC DATA

Enter the codes and values appropriate for this sample. Code (<) if less than value, and (>) if greater than value, otherwise leave this column blank. Continue if necessary, on additional worksheets. Codes to describe the benthic sampling effort are listed on the back. Benthic data must be submitted with a Habitat Assessment.

CODE	(<) or (>)	Value	Description

Benthic Macroinvertebrate Parameter Codes

NOTE: Measurements reported in metric units

**** Indicates Parameter Measured at Sample Point (e.g. riffle from which benthic sample is collected)**

Overall Benthic Sample Descriptors					
89899	0	Biological-data reporting units (Values: 1= no. of individuals from subsample; 2 = no. of individuals/ft2; 3 = no. of individuals/m2; 4 = total no. in kicknet)	89946	0	Mesh size, any net or sieve (diagonal measurements) for benthic collection (cm)
89950	0	Benthic Sampler (1=Surber, 2=Ekman, 3=kicknet, 4=Petersen, 5=Hester-Dendy)	89961	0	Texas Ecoregion Code
90005	N/A	Benthos sampled—no organisms present (0=none present)	84161	0	Stream order
*89921	0	Undercut bank at sample point (%)	*89925	0	Soft bottom at sample point (%)
*89922	0	Overhanging brush at sample point (%)	*89926	0	Macrophyte bed at sample point (%)
*89923	0	Gravel substrate at sample point (%)	*89927	0	Snags and brush at sample point (%)
*89924	0	Sand substrate at sample point (%)	*89928	0	Bedrock at sample point (%)
Quantitative Benthic Sample Descriptors					
89901	N/A	Surber-sampler effort, area sampled (m_2)	90058	0	Total no. of intolerant taxa
89935	N/A	Ekman-sampler effort, area sampled (m_2)	90060	#DIV/0!	EPT taxa (% of community)
89934	N/A	Petersen-sampler effort, area sampled (m_2)	90062	#DIV/0!	Chironomidae (% of community)
89933	N/A	Hester-Dendy duration (days)	90066	#DIV/0!	Tolerant taxa (% of community), benthos
89975	N/A	Area of snag surface sampled (m2)	90020	#DIV/0!	Benthic grazers (% of community)
90055	0	Total taxa (taxa richness), benthos no. taxa	90025	#DIV/0!	Benthic gatherers (% of community)
90056	0	Total no. of Diptera taxa	90030	#DIV/0!	Benthic filterers (% of community)
90057	0	Total no. of Ephemeroptera taxa	90067	#NUM!	Dominant 3 taxa (% of community)
RBAP Benthic Sample Descriptors					
89902	N/A	Dip-net effort, area swept (m2)	90042	#NUM!	Dominant taxon, benthos (% of community)
89903	0	Kicknet effort, area kicked (m2)	90010	#DIV/0!	Dominant functional feeding group (% of community)
89904	0	Kicknet effort, minutes kicked (min.)	90036	#DIV/0!	Benthic predators (% of community)
89905	N/A	Snags-and-shoreline sampling effort, minutes picked	90050	#DIV/0!	Ratio of intolerant: tolerant taxa
89906	0	Number of individuals in benthic sample	90069	N/A	Total Trichoptera as Hydropsychidae (%)
90055	0	Total taxa (taxa Richness), Benthos, no. taxa	90052	0	Total no. non-insect taxa
90008	0	EPT taxa abundance (no. taxa)	90025	#DIV/0!	Benthic gatherers (% of community)
90007	#DIV/0!	Hilsenhoff biotic index (HBI)	90054	#DIV/0!	Total no. as Elmidae (% of community)
90062	#DIV/0!	Chironomidae (% of community)			

Metrics and Scoring for Kick Samples
Rapid Bioassessment Protocol
Benthic Macroinvertebrates Worksheet

Stream Name: 0			
Date: 1/0/1900	**Collectors:** 0		
Location: -			
County: 0	**Ecoregion Number:** 0		
Type of Assessment: UAA	ALA	ALM	RWA
Metric	**Value**		**Score**
1. Taxa Richness	0		1
2. EPT Taxa Abundance	0		1
3. Biotic Index (HBI)	#DIV/0!		#DIV/0!
4. % Chironomidae	#DIV/0!		#DIV/0!
5. % Dominant Taxon	#NUM!		#NUM!
6. % Dominant FFG	#DIV/0!		#DIV/0!
7. % Predators	#DIV/0!		#DIV/0!
8. Ratio of Intolerant:Tolerant Taxa	#DIV/0!		#DIV/0!
9. % of Total Trichoptera as Hydropsychidae	N/A		1
10. # of Non-Insect Taxa	0		1
11. % Collector-Gatherers	#DIV/0!		#DIV/0!
12. % of Total Number as Elmidae	#DIV/0!		#DIV/0!
Aquatic Life Use Point Score Ranges:	Exceptional: > 36 High: 29-36 Intermediate: 22-28 Limited: < 22		
		Total Score:	#DIV/0!
		Aquatic Life Use:	#DIV/0!

Scoring Criteria				
Metric	4	3	2	1
1. Taxa Richness	> 21	15–21	8–14	< 8
2. EPT Taxa Abundance	> 9	7–9	4–6	< 4
3. Biotic Index (HBI)	< 3.77	3.77–4.52	4.53–5.27	>5.27
4. % Chironomidae	0.79–4.10	4.11–9.48	9.49–16.19	< 0.79 or > 16.19
5. % Dominant Taxon	< 22.15	22.15–31.01	31.02–39.88	> 39.88
6. % Dominant FFG	< 36.50	36.50–45.30	45.31–54.12	> 54.12
7. % Predators	4.73–15.20	15.21–25.67	25.68–36.14	< 4.73 or >36.14
8. Ratio of Intolerant:Tolerant Taxa	> 4.79	3.21–4.79	1.63–3.20	< 1.63
9. % of Total Trichoptera as Hydropsychidae	< 25.50	25.51–50.50	50.51–75.50	> 75.50 or no Trichoptera
10. # of Non-Insect Taxa	> 5	4–5	2–3	< 2
11. % Collector-Gatherers	8.00–19.23	19.24–30.46	30.47–41.68	< 8.00 or > 41.68
12. % of Total Number as Elmidae	0.88–10.04	10.05–20.08	20.09–30.12	< 0.88 or > 30.12

TCEQ Benthic Macroinvertebrate Laboratory Bench Sheet	
Sample tracking log number:	0
Name of identifier:	0
Location of collection:	0
Method of collection:	
Date of collection:	1/0/1900
Date entered in sample tracking log:	1/0/1900
Date identification/enumeration started:	1/0/1900
Date identification/enumeration completed:	1/0/1900

Scientific Name	Storet Code	Number of Individuals

TCEQ Benthic Macroinvertebrate Sample Tracking Log

Sample tracking log number:	0
Name of collector:	0
TCEQ Station ID:	0
Location description:	0
Date of collection:	1/0/1900
Date entered in sample tracking log:	1/0/1900
Date identification started:	1/0/1900
Date identification completed:	1/0/1900
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:	

Biological Chain of Custody

TRA BIOLOGICAL CHAIN-OF-CUSTODY

Station: Segment:	Region:	Ecoregion:

NEKTON SAMPLES FOR SPECIES IDENTIFICATION

Start Date:	Start Time:
End Date:	End Time:

Container Type/Size	# of Containers	Container ID	Preservative	Collected By

BENTHIC MACROINVERTEBRATE SAMPLES FOR SPECIES IDENTIFICATION

Start Date:	Start Time:
End Date:	End Time:

Container Type/Size	# of Containers	Container ID	Preservative	Collected By

Relinquished By: _____
Date/Time: _____
Received By: _____
Date/Time: _____

Relinquished By: _____
Date/Time: _____
Received By: _____
Date/Time: _____

Relinquished By: _____
Date/Time: _____
Received By: _____
Date/Time: _____

Corrections must be made with a single strike-thru and initialed. No writeovers, scratchouts, or whiteout.

Customer: Trinity River Authority
Attention: Angela Kilpatrick
5300 South Collins
Arlington, TX 76018
817-493-5179
kilpatricka@trinityra.org

Nekton Data Reporting Form

PERIOD – Nekton Data Reporting Form

Tag#:	Placeholder	Region:	0	Email:	0		
Station ID:	0	Segment:	0	Data Source:	0	0	0

Station Description: 0

Composite - Most biological samples will be: Both

COMPOSITE SAMPLE

B COMPOSITE CATEGORY : T=Time S=Space B=Both

01/00/1900	0:00	0.00	M
START DATE (MM/DD/YYYY)	START TIME (HH:MM)	START DEPTH (SHALLOWEST)	M=meters F=feet
01/00/1900	0:00	0	M
END DATE (MM/DD/YYYY)	END TIME (HH:MM)	END DEPTH (DEEPEST)	M=meters F=feet

PARAMETRIC DATA

Enter the codes and values appropriate for this sample. Code (<) if less than value, and (>) if greater than value, otherwise leave this column blank. Continue if necessary, on additional worksheets. Codes to describe the nekton sampling effort are listed on the back. Nekton data must be submitted with a Habitat Assessment.

These data represent total counts from both electrofishing and seining and are not included in the dataset. Count data are reported under the tag numbers electrofishing and seining.

CODE	(<) or (>)	Value	Description

Nekton Parameter Codes

NOTE: All measurements reported in metric units

Nekton Parameter Codes					
98005	N/A	Nekton, None Captured	98003	0	Total # Fish Species (Richness)
89944	0	Electrofishing Effort, Duration of Shocking (sec.)	98008	0	Total # of Sunfish Species (except bass)
89947	0	Seining Effort (# of Seine Hauls)	98010	0	Total # of Intolerant Fish Species
89948	0	Combined Length of Seine Hauls (meters)	98070	#DIV/0!	% of individuals as tolerant species (excluding western mosquitofish)
89949	0	Seining Effort, Duration (min.)	98017	#DIV/0!	Omnivore Individuals (% of community)
89930	0	Minimum Seine Mesh Size, net average bar (inches)	98021	#DIV/0!	Invertivore Individuals (% of community)
89931	0	Maximum Seine Mesh Size, net average bar (inches)	98022	#DIV/0!	Piscivore Individuals (% of community)
89941	0	Net Length (meters)	98039	0	Total # of Individuals, Seining
89943	2	Electrofishing Method (1= boat, 2=backpack, 3=tote barge)	98040	0	Total # of Individuals, Electrofishing
89976	0	Area Seined (m2)	98062	#DIV/0!	# of individuals per seine haul
89961	0	Ecoregion (Texas Ecoregion Code)	98069	#DIV/0!	# of individuals per minute electrofishing
98032	0	Total # of Native Cyprinid Species	98052	0	Total # of Benthic Invertivore Species
98033	#DIV/0!	Individuals as Non-native Species (% of community)	98053	0	Total # of Benthic Species (catfish, suckers, and darters)
98030	#DIV/0!	Individuals with Disease / Anomalies (% of community)	84161	0	Stream Order
Additional Parameters					
89942	N/A	Net or Hook & Line Effort, Duration in Water (hrs)	89951	N/A	Cooling Water Intake Screen (1=revolving, 2=static)
89945	N/A	Castnetting Effort (# of casts)	89940	N/A	Intake Screen Collection, Duration (min.)
89907	N/A	Trawl, Otter, Duration (min.)	89953	N/A	Trawl, Otter, Width (meters)

Quantitative Biological Scoring for Evaluating
Aquatic Life Use Subcategories
Regional Criteria Worksheets for Fish
Ecoregion: 0

Stream Name: 0	Location: 0	Date: 1/0/1900
Collector: 0	County: 0	
No. seine hauls: 0		
Electrofishing effort (min): 0.00		

Metric Category	Intermediate Totals for Metrics		Metric Name	Raw Value	IBI Score
Species richness and composition	Drainage basin size (km^2)	0	Drainage basin size (km^2)	0	N/A
	Number of fish species	0	Number of fish species	0	
	Number of native Cyprinid species	0	Number of native Cyprinid species	0	
	Number of benthic species (catfish, suckers, and darters)	0	Number of benthic species (catfish, suckers, and darters)	0	
	Number of benthic invertivore species	0	Number of benthic invertivore species	0	
	Number of sunfish species (except bass)	0	Number of sunfish species (except bass)	0	
	Number of intolerant species	0	Number of intolerant species	0	
	Number of individuals as tolerants[a]	0	% of individuals as tolerant species[a]	#DIV/0!	
Trophic composition	Number of individuals as omnivores	0	% of individuals as omnivores	#DIV/0!	
	Number of individuals as invertivores	0	% of individuals as invertivores	#DIV/0!	
	Number of individuals as piscivores	0	% of individuals as piscivores	#DIV/0!	
Fish abundance and condition	Number of individuals in sample	0	Number of individuals in sample	0	N/A
	Number of individuals (seine)	0	Number of individuals/seine haul	#DIV/0!	
	Number of individuals (electrofishing)	0	Number of individuals/min electrofishing	#DIV/0!	
	# of individuals as non-native species	0	% of individuals as non-native species	#DIV/0!	
	# of individuals with disease/anomaly	0	% of individuals with disease/anomaly	#DIV/0!	
			Index of biotic integrity numeric score:		0
			Aquatic life use:		

This data should be incorporated with water quality, habitat, and other available biological data to assign an overall stream score.

[a] Excluding western mosquitofish

	Ecoregion 24			Ecoregion 25 and 26			Ecoregion 27, 29, and 32		
	Scoring Criteria			Scoring Criteria			Scoring Criteria		
Metric	5	3	1	5	3	1	5	3	1
Total number of fish species	See Figure B.1			See Figure B.2			See Figure B.3		
Number of native cyprinid species	> 4	3 - 4	< 3	> 2	2	< 2	> 3	2 - 3	< 2
Number of benthic species (catfish, suckers, and darters)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Number of Benthic Invertivore Species	>1	1	0	N/A	N/A	N/A	> 1	1	0
Number of Sunfish Species (except bass)	>1	1	0	>1	1	0	> 3	2 - 3	< 2
Number of Intolerant Species	>1	1	0	N/A	N/A	N/A	N/A	N/A	N/A
% Individuals as Tolerant Species (excluding western mosquitofish)	< 26	26 - 50	> 50	N/A	N/A	N/A	< 26	26 - 50	> 50
% of Individuals as Omnivores	< 9	9 - 16	>16	< 9	9 - 16	> 16	< 9	9 - 16	> 16
% of Individuals as Invertivores	> 65	33 - 65	< 33	> 65	33 - 65	< 33	> 65	33 - 65	< 33
% of Individuals as Piscivores	N/A	N/A	N/A	N/A	N/A	N/A	> 9	5 - 9	< 5
Number of individuals / seine haul	> 160.4	80.2 - 160.4	< 80.2	> 41.7	20.9 - 41.7	< 20.9	> 87	36 - 87	< 36
Number of individuals / minutes of electrofishing	> 26.5	13.2 - 26.5	< 13.3	N/A	N/A	N/A	> 7.1	3.3 - 7.1	< 3.3
% of Individuals as Non-Native Species	< 1.4	1.4 - 2.7	> 2.7	< 1.4	1.4 - 2.7	> 2.7	< 1.4	1.4 - 2.7	> 2.7
% of Individuals with Disease or Other Anomaly	< 0.6	0.6 - 1.0	> 1.0	< 0.6	0.6 - 1.0	> 1.0	< 0.6	0.6 - 1.0	> 1.0
Aquatic Life Use Category	≥ 43, exceptional			≥ 36, exceptional			≥ 49, exceptional		
	37–42, high			34–35, high			41–48, high		
	35–36, intermediate			24–33			35–40, intermediate		
	< 35 limited			< 24 limited			< 35, limited		

	Ecoregion 30			Ecoregion 31			Ecoregion 33 and 35			Ecoregion 34		
	Scoring Criteria			Scoring Criteria			Scoring Criteria			Scoring Criteria		
Metric	5	3	1	5	3	1	5	3	1	5	3	1
Total number of fish species	See Figure B.4			See Figure B.5			See Figure B.6			See Figure B.7		
Number of native cyprinid species	> 4	3 - 4	< 3	> 5	3 - 5	< 3	> 4	2 - 4	< 2	> 2	2	< 2
Number of benthic species (catfish, suckers, and darters)	N/A	N/A	N/A	> 2	2	< 2	N/A	N/A	N/A	N/A	N/A	N/A
Number of Benthic Invertivore Species	> 1	1	0	N/A	N/A	N/A	> 4	3 - 4	< 3	> 1	1	0
Number of Sunfish Species (except bass)	> 3	2 - 3	< 2	> 4	3 - 4	< 3	> 4	3 - 4	< 3	> 3	2 - 3	< 2
Number of Intolerant Species	> 1	1	0	N/A	N/A	N/A	> 3	2 - 3	< 2	≥ 1	N/A	0
% Individuals as Tolerant Species (excluding western mosquitofish)	< 26	26 - 50	> 50	< 26	26 - 50	> 50	< 26	26 - 50	> 50	< 26	26 - 50	> 50
% of Individuals as Omnivores	< 9	9 - 16	> 16	< 9	9 - 16	> 16	< 9	9 - 16	> 16	< 9	9 - 16	> 16
% of Individuals as Invertivores	> 65	33 - 65	< 33	> 65	33 - 65	< 33	> 65	33 - 65	< 33	> 65	33 - 65	< 33
% of Individuals as Piscivores	> 8	3.9 - 8.0	< 3.9	> 9	5 - 9	< 5	> 9	5 - 9	< 5	N/A	N/A	N/A
Number of individuals / seine haul	> 48	37 - 48	< 37	> 39.5	19.7 - 39.5	< 19.7	> 28	14 - 28	< 14	> 174.7	87.4 - 174.7	< 87.4
Number of individuals / minutes of electrofishing	> 5	2.5 - 5	< 2.5	> 8.9	4.4 - 8.9	< 4.4	> 7.3	3.6 - 7.3	< 3.6	> 7.7	3.9 - 7.7	< 3.9
% of Individuals as Non-Native Species	< 1.4	1.4 - 2.7	> 2.7	< 1.4	1.4 - 2.7	> 2.7	< 1.4	1.4 - 2.7	> 2.7	< 1.4	1.4 - 2.7	> 2.7
% of Individuals with Disease or Other Anomaly	< 0.6	0.6 - 1.0	> 1.0	< 0.6	0.6 - 1.0	> 1.0	< 0.6	0.6 - 1.0	> 1.0	< 0.6	0.6 - 1.0	> 1.0
Aquatic Life Use Category	≥ 52, exceptional			≥ 42, exceptional			≥ 52, exceptional			≥ 49, exceptional		
	42–51, high			37–41, high			42–51, high			39–48, high		
	30–41, intermediate			25–36, intermediate			36–41, intermediate			31–38, intermediate		
	< 30, limited			< 25, limited			< 36, limited			< 31, limited		

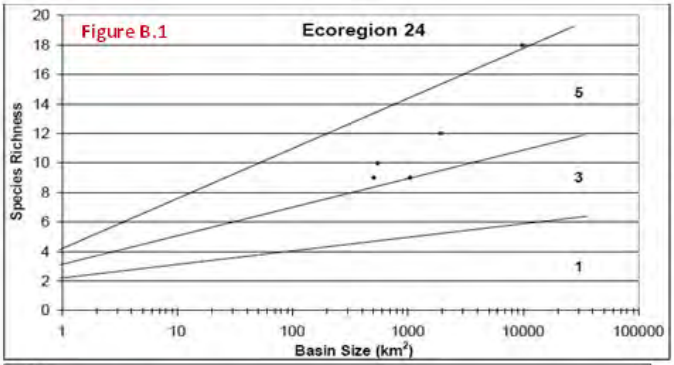


Figure B.1
Ecoregion 24
Species Richness
Basin Size (km²)
5
3
1

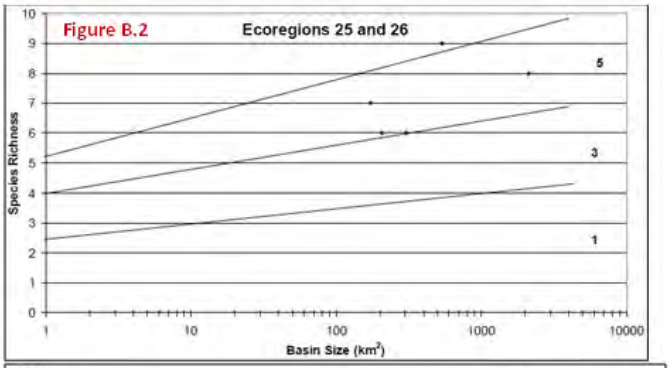


Figure B.2
Ecoregions 25 and 26
Species Richness
Basin Size (km²)
5
3
1

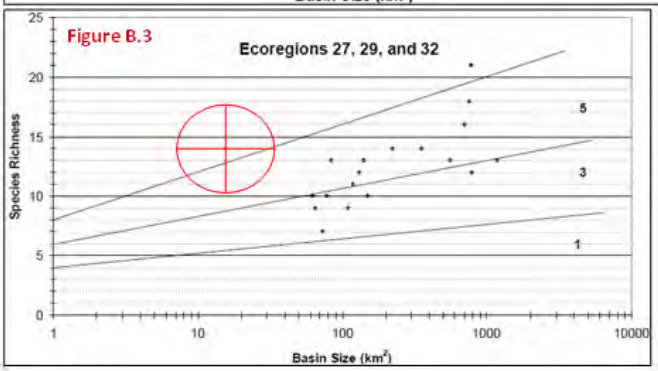


Figure B.3
Ecoregions 27, 29, and 32
Species Richness
Basin Size (km²)
5
3
1

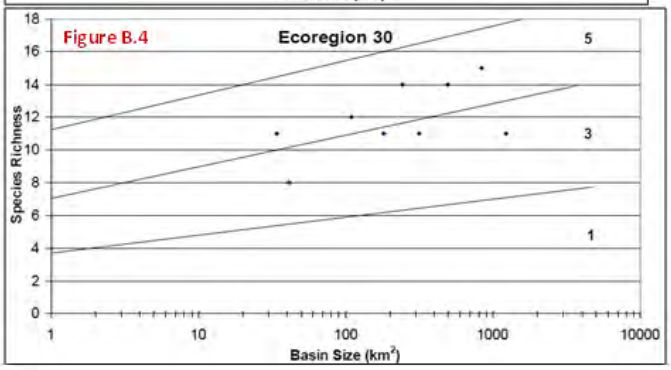


Figure B.4
Ecoregion 30
Species Richness
Basin Size (km²)
5
3
1

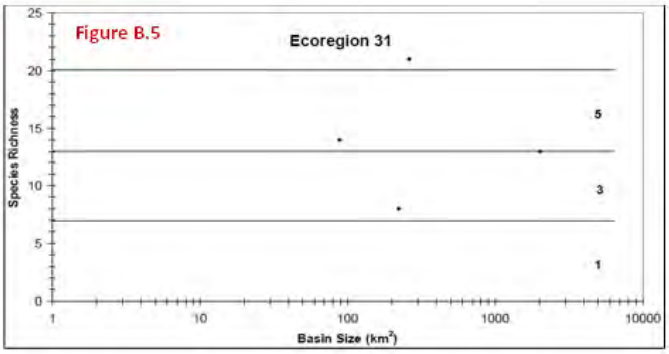


Figure B.5
Ecoregion 31
Species Richness
Basin Size (km²)
5
3
1

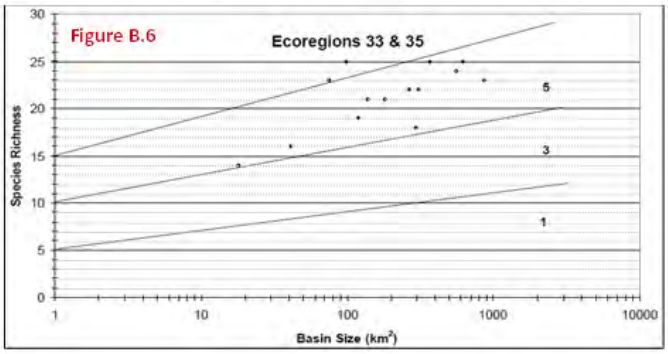


Figure B.6
Ecoregions 33 & 35
Species Richness
Basin Size (km²)
5
3
1

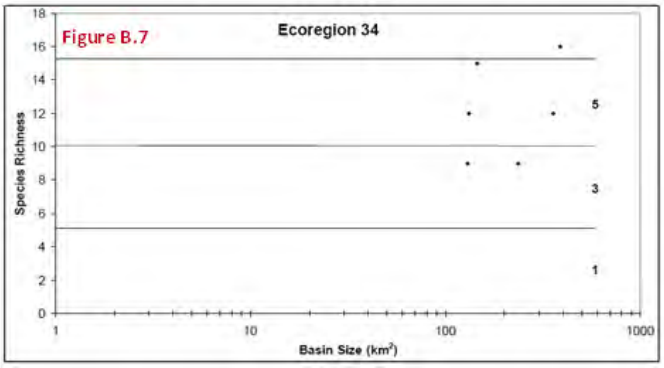


Figure B.7
Ecoregion 34
Species Richness
Basin Size (km²)
5
3
1

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Fish-Collection Data

Scientific-Collection Permit No. 0

Water body:* 0		**Date:*** 1/0/1900	
Location:* 0		**Time:*** 0:00 to 0:00	
Station no.: 0		**County:*** 0	
Weather: 0		**Lat/Long:** 0	
Secchi depth (m): 0		**Flow (cfs):** 0	
Avg depth: 0		**Max depth:** 0	
Water temp (1'): 0		**DO (1'):** 0	
Spec cond (1'): 0		**pH (1'):** 0	
Collectors:** 0			
Gear Used			
Boat-Mounted Electrofisher	Low range:	High range:	AC or DC?
	Pulses/sec:	% on:	
	Amps (A):	Duration (sec):	
Backpack Electrofisher	Voltage (V): 0	Frequency (pps): 0	
	Pulse width (msec): 0	Duration (sec): 0	
Gill net	Mesh size:	Length:	Duration of set:
Trawl	Width:	No. hauls:	Duration of haul:
Seine	Length (m): 0	No. hauls: 0	Duration (min): 0
Cast net	Diameter:	No. casts or Duration of casting:	
Other (specify)			
Habitat(s) sampled: 0			
Observations/ comments: 0			

* **Required information** when reporting fish-collection data to the Texas Parks and Wildlife Department. Holders of scientific-collection permits are required to submit an annual collection summary to the TPWD.

** Collectors must be listed in Appendix I of the scientific-collection permit. Each permit contains detailed requirements.

TCEQ Fish Sample Tracking Log

Sample tracking log number: 0			TCEQ Station ID: 0
Location description: 0			
Collector(s): 0			
Identifier(s): 0			
Dates			
Collected 1/0/1900	Entered into Log 1/0/1900	Transferred to EtOH 1/0/1900	Identified 1/0/1900
Methods			
Seine hauls:	Electrofish (secs.): 0	Gill net duration:	Other:

Sample tracking log number: 0			TCEQ Station ID: 0
Location description: 0			
Collector(s): 0			
Identifier(s): 0			
Dates			
Collected 1/0/1900	Entered into Log 1/0/1900	Transferred to EtOH 1/0/1900	Identified 1/0/1900
Methods			
Seine hauls: 0	Electrofish (secs.):	Gill net duration:	Other:

Sample tracking log number:			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 Fish Laboratory Bench Sheet

Sample tracking log number: 0	Method of collection: **Electofishing**
Name of identifier: 0	
Location of collection: 0	
Date of collection: 1/0/1900	
Date entered in sample tracking log: 1/0/1900	
Date identification/enumeration started: 1/0/1900	
Date identification/enumeration completed: 1/0/1900	

Scientific Name	Storet Code	Number of Individuals

ELECTROFISHING
(PAGE 1 of 1)

Date: 1/0/1900 Stream: 0

Permittee Name: 0

County: 0

Scientific Collection Permit Number: 0

Species	Measured Lengths (mm)										# Caught & Live Released	VOUCHER # Preserved "Live Take"	# Incidential Mortalities	Grand Total	Of Total, Note Anomaly & # Affected	VOUCHER Photo
														0		
														0		
														0		
														0		
														0		
														0		
														0		
														0		
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														0		
														0		
														0		

ELECTROFISHING VOUCHER PHOTOS

TCEQ Fish Laboratory Bench Sheet

Sample tracking log number:	0	Method of collection:	**Seine**
Name of identifier:	0		
Location of collection:	0		
Date of collection:	1/0/1900		
Date entered in sample tracking log:	1/0/1900		
Date identification/enumeration started:	1/0/1900		
Date identification/enumeration completed:	1/0/1900		

Scientific Name	Storet Code	Number of Individuals

SEINE
(PAGE 1 of 1)

Date: 1/0/1900 Stream: 0
Permittee Name: 0

County: 0
Scientific Collection Permit Number: 0

Species	Measured Lengths (mm)	# Caught & Live Released	VOUCHER # Preserved "Live Take"	# Incidential Mortalities	Grand Total	Of Total, Note Anomaly & # Affected	VOUCHER Photo
					0		
					0		
					0		
					0		
					0		
					0		
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					0		
					0		

SEINE VOUCHER PHOTOS