



Guidance for Partners in the Texas Clean Rivers Program

FY2024-2025

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TCEQ PG-001
August 2023

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Contents

| | |
|---|----------|
| Task 1: Project Administration..... | 8 |
| About Task 1 | 10 |
| Contract Initiation and Development | 10 |
| Work Plan Development..... | 10 |
| Deliverables and Due Dates | 13 |
| Review of Deliverables by TCEQ | 13 |
| Progress Reports | 15 |
| Conference Calls | 16 |
| Training Events and Conferences | 16 |
| Reimbursement Procedures | 16 |
| Due Dates..... | 17 |
| Reimbursement Request and Review..... | 17 |
| Contract Management | 21 |
| Contract Changes..... | 21 |
| Procurement of Subrecipients or Vendors | 22 |
| Contract Monitoring..... | 25 |
| Performance Self Evaluation..... | 26 |
| Risk Assessments | 26 |
| Desk Reviews | 26 |
| Site Visits..... | 26 |
| TCEQ Compliance Audits..... | 26 |
| Annual Independent Audit..... | 27 |
| Exhibit 1A. FY2024-2025 Budget Allocations | 28 |
| Exhibit 1B. Budget Categories and Documentation Required to Process Reimbursement Requests..... | 30 |
| Exhibit 1C. The Contract Administration File..... | 36 |
| The Contract Administration File..... | 37 |
| Exhibit 1D. Progress Report Format..... | 38 |
| Deliverable Status Template..... | 39 |
| Template for Activities Description | 40 |
| Template for the Monitoring Activities Report | 42 |
| Exhibit 1E. Personnel Eligibility List and Fringe Benefits Methodology..... | 45 |
| Personnel Eligibility List | 46 |
| Fringe Benefits Methodology | 47 |



| | |
|---|-----------|
| Exhibit 1F. Equipment Inventory Format | 48 |
| Exhibit 1G. Procurement System Certification | 50 |
| Exhibit 1H. Workplan Shell..... | 52 |
| Task 2: Quality Assurance..... | 73 |
| About Task 2 | 75 |
| Contract Provisions..... | 75 |
| Approval to Conduct Work | 76 |
| QAPP Extensions | 76 |
| Quality Assurance Project Plans | 77 |
| Biennial Submittal of Basin-wide QAPPs | 77 |
| Data Collection Procedures | 77 |
| QAPP Maps | 77 |
| Draft QAPPs | 78 |
| Basin-wide QAPPs | 78 |
| QAPP Amendments | 79 |
| Annual QAPP Updates, Including Appendix B: Monitoring Schedule Update | 81 |
| Project Oversight | 81 |
| Planning Agency Oversight Requirements..... | 81 |
| Status Monitoring | 81 |
| Laboratory Oversight | 82 |
| Subparticipant Oversight Requirements | 82 |
| Readiness Review..... | 83 |
| Monitoring Systems Audit | 83 |
| Data Traceability Exercises | 83 |
| Report and Response..... | 84 |
| Corrective Action Process for Deficiencies..... | 84 |
| Data Review, Verification, and Validation | 86 |
| TCEQ Oversight Requirements | 89 |
| TCEQ Laboratory and Monitoring Systems Audits | 89 |
| Website Deliverable..... | 92 |
| Quality Assurance Training..... | 92 |
| Special Project Planning | 93 |
| QAPP Appendices | 94 |
| Special Study or Permit Support Monitoring..... | 94 |

| | |
|---|------------|
| Use of Acquired Data..... | 94 |
| Exhibit 2A. Corrective Action Process Flow Chart..... | 96 |
| Exhibit 2B. Corrective Action Status Table..... | 98 |
| Exhibit 2C. Corrective Action Plan Form..... | 100 |
| Exhibit 2D. Clean Rivers Program Audit Checklist..... | 103 |
| Exhibit 2E. Audit Response Template..... | 120 |
| Task 3: Water Quality Monitoring | 123 |
| General Monitoring Guidance | 124 |
| Deliverables..... | 124 |
| Types of Monitoring..... | 125 |
| Routine Monitoring..... | 125 |
| Systematic Watershed Monitoring..... | 126 |
| Permit Support Monitoring..... | 126 |
| Special Studies in Priority Watersheds | 128 |
| Special Studies Mapping | 128 |
| Continuous Monitoring..... | 129 |
| Parameters Monitored | 129 |
| Field Parameters | 129 |
| Conventional Parameters | 130 |
| Toxic Substances | 130 |
| Bacterial Measurements..... | 131 |
| Biological or Habitat Assessments | 131 |
| Ambient Toxicity | 132 |
| Basin Monitoring Planning, Coordination, and Development..... | 133 |
| Coordinated Monitoring Process..... | 133 |
| Participation in Coordinated Monitoring Meetings | 133 |
| Preparation for Coordinated Monitoring Meetings | 134 |
| Conducting a Coordinated Monitoring Meeting | 135 |
| Maintaining the Monitoring Schedule..... | 135 |
| Exhibit 3A. Special Study Report Components..... | 137 |
| Exhibit 3B. Coordinated Monitoring Meeting..... | 140 |
| Task 4: Data Management | 142 |
| About Task 4 | 143 |
| Data Management Roles..... | 143 |
| Data Management for the Basin Planning Agency | 143 |
| TCEQ Data Management | 143 |



| | |
|---|------------|
| Preparing and Reporting Data | 144 |
| Formatting Data | 144 |
| Coding Data | 145 |
| Biological Electronic Data Reporting | 145 |
| Composite Samples | 147 |
| Data Review and Validation | 148 |
| Submitting Data to TCEQ | 150 |
| Other Data Management Considerations | 152 |
| Creating New Sampling Stations and New Codes | 152 |
| Data Correction Requests | 153 |
| Data Resubmittals | 153 |
| Data on Basin Planning Agency Webpages | 154 |
| Distribution of Provisional Data | 154 |
| CRP Data Management Training | 154 |
| Exhibit 4A. Data Review Checklist | 155 |
| Exhibit 4B. Example Data Summary | 158 |
| Exhibit 4C. Understanding Biological Event Data Tagging | 162 |
| Exhibit 4D. Binary Large Object (BLOB) File Guidance and Examples | 167 |
| Exhibit 4E. SWQMIS Validations | 176 |
| Exhibit 4F. Data Submittal Progress Report | 178 |
| Template for the Data Submittal Progress Report | 179 |
| Task 5: Data Analysis and Reporting | 181 |
| About Task 5 | 182 |
| Basin Highlights Report | 182 |
| Format for Basin Highlights Reports | 182 |
| Basin Summary Report | 185 |
| Review of the Basin Summary Report | 187 |



| | |
|--|------------|
| Exhibit 5A. Standard Basin Highlights Report Outline and Examples | 189 |
| Exhibit 5B. Watershed Characterization Report: Content and Examples | 199 |
| Example Text | 202 |
| Exhibit 5C. Outline and Example for the Program Update Report..... | 208 |
| Exhibit 5D. Basin Summary Report Outline | 219 |
| Exhibit 5E. Data Analysis Steps (for the Basin Summary Report Watershed Summaries) | 226 |
| Exhibit 5F. Example Watershed Summary (Example for the Basin Summary Report) | 230 |
| Exhibit 5G. Priority Parameter Descriptions (Example for the Basin Summary Report Water Quality Terminology)..... | 248 |
| Task 6: Stakeholder Participation and Public Outreach..... | 253 |
| About Task 6 | 254 |
| Stakeholder Participation | 254 |
| Basin Steering Committee | 255 |
| Membership Guidelines..... | 255 |
| Regular Communication | 256 |
| Meetings | 257 |
| Stakeholder Process Evaluation..... | 259 |
| Cooperative Watershed Planning..... | 259 |
| Education and Outreach..... | 260 |
| EPA Outreach Documents..... | 261 |
| Planning Agency Website | 261 |
| Volunteer Monitoring | 265 |
| Exhibit 6A. Stakeholder Questionnaire | 266 |
| Task 7: Special Projects | 270 |
| About Task 7 | 271 |
| Nonpoint Source Projects | 272 |
| Watershed Protection Plans | 272 |

Figures

| | |
|--|-----|
| Figure 4-1. Biological Event Tagging..... | 163 |
| Figure 4-2. Sample Set Identification Structure | 164 |
| Figure 4-3. Sample Event ID Structure | 165 |
| Figure 4-4. Read Me File Structure | 166 |
| Figure 4-5. ALM Checklist Example | 170 |
| Figure 4-6. Site Map Example | 171 |
| Figure 4-7. Fish Voucher Photos Example..... | 172 |
| Figure 4-8. Habitat Transect Photos Example | 173 |
| Figure 4-9. Habitat Transect Worksheet Example | 174 |
| Figure 4-10. Habitat Transect Data Worksheet Example | 175 |
| Figure 5-1. Example Watershed Map | 205 |
| Figure 5-2. Example of a Segment Map..... | 206 |
| Figure 5-3. Example of a Monitoring Site Photo | 207 |
| Figure 5-4. Example Program Update Report Page 1 | 210 |
| Figure 5-5. Example Program Update Page 2..... | 211 |
| Figure 5-6. Example Program Update Page 3..... | 212 |
| Figure 5-7. Example Program Update Page 4..... | 213 |
| Figure 5-8. Example Program Update Page 5..... | 214 |
| Figure 5-9. Example Program Update Page 6..... | 215 |
| Figure 5-10. Example Program Update Page 7 | 216 |
| Figure 5-11. Example Program Update Page 8 | 217 |
| Figure 5-12 Example Program Update Page 9 | 218 |
| Figure 5-13. Example Watershed Summary #1 Page 1 | 233 |
| Figure 5-14. Example Watershed Summary #1 Page 2 | 234 |
| Figure 5-15. Example Watershed Summary #1 Page 3 | 235 |
| Figure 5-16. Example Watershed Summary #1 Page 4 | 236 |
| Figure 5-17. Example Watershed Summary #1 Page 5 | 237 |
| Figure 5-18. Example Watershed Summary #1 Page 6 | 238 |
| Figure 5-19. Example Watershed Summary #1 Page 7 | 239 |
| Figure 5-20. Example Watershed Summary #1 Page 8 | 240 |
| Figure 5-21. Example Watershed Summary #2 Page 1 | 241 |
| Figure 5-22. Example Watershed Summary #2 Page 2 | 242 |
| Figure 5-23. Example Watershed Summary #2 Page 3 | 243 |
| Figure 5-24. Example Watershed Summary #2 Page 4 | 244 |

| | |
|--|-----|
| Figure 5-25. Example Watershed Summary #2 Page 5 | 245 |
| Figure 5-26. Example Watershed Summary #2 Page 6 | 246 |
| Figure 5-27. Example Watershed Summary #2 Page 7 | 247 |

Tables

| | |
|--|-----|
| Table 1-1. Supporting Documentation Required..... | 11 |
| Table 1-3. Time Frames for Work Plan and Documentation..... | 13 |
| Table A-1. FY2024-2025 Budget Allocations | 29 |
| Table B-1. Budget Categories and Documentation Required to Process Reimbursement Requests..... | 31 |
| Table D-1. Deliverable Status Report, FY 24 Quarter 1, Sept. 1, 2023 through Nov. 30, 2023 | 39 |
| Table D-2. Description of Activities, FY 24 Quarter 1, Sept. 1, 2023 through Nov. 30, 2023 | 40 |
| Table D-3. Monitoring Activities Report, Q2, Dec. 1, 2023-Feb. 28, 2024 | 43 |
| Table E-1. Fringe Benefits Methodology | 47 |
| Table F-1. Equipment Inventory Format..... | 49 |
| Table G-1. Procurement System Certification | 51 |
| Table 2-1: Verification and Validation Tasks | 88 |
| Table 2-2. Corrective Action Status Table..... | 99 |
| Table 2-3. Corrective Action Plan Form..... | 101 |
| Table 2-4. Clean Rivers Program Audit Checklist Introduction..... | 104 |
| Table 2-5. Clean Rivers Program Audit Checklist | 105 |
| Table 2-6. Audit Response Template | 121 |
| Table 4-1. Data Review Checklist | 156 |
| Table 4-2. Monitoring Discrepancies..... | 160 |
| Table 4-3. Data Loss | 161 |
| Table 4-4. Read Me File Example (ReadMe.txt)..... | 169 |
| Table 4-6. Data Submittal Progress Report..... | 179 |
| Table 5-1. Basin Summary Report Rotational Schedule..... | 185 |
| Table 5-2. Example River Basin Monitoring Schedule | 194 |
| Table 5-3. Example Watershed Characterization Content..... | 200 |
| Table 5-4. Explanations of Water Quality Issues and Possible Solutions | 231 |
| Table 5-5. Priority Parameter Definitions and Descriptions..... | 249 |

Task 1: Project Administration

In This Task

| | |
|---|----|
| About Task 1 | 10 |
| Contract Initiation and Development | 10 |
| Work Plan Development | 10 |
| Supporting Documentation | 10 |
| Budget Preparation | 12 |
| Time Frame for Submission of Work Plan and Supporting Documentation | 13 |
| Deliverables and Due Dates | 13 |
| Review of Deliverables by TCEQ | 13 |
| Requesting Extension of a Due Date | 14 |
| Progress Reports | 15 |
| Format and Contents | 15 |
| Conference Calls | 16 |
| Training Events and Conferences | 16 |
| Reimbursement Procedures | 16 |
| Due Dates | 17 |
| Quarterly Reimbursement | 17 |
| Final Payment | 17 |
| Reimbursement Request and Review | 17 |
| Documentation Required for Allowable Cost Categories | 18 |
| Allowable and Unallowable Costs | 18 |
| Unallowable and Non-reimbursable Costs | 19 |
| Reimbursable Costs | 20 |
| Questioned or Disallowed Costs | 20 |
| Contract Management | 21 |
| Contract Changes | 21 |
| Budget Revisions | 21 |
| Procurement of Subrecipients or Vendors | 22 |
| Subrecipient and Vendor Determinations | 22 |
| Procurement Procedures | 22 |
| Procurement Deliverable to TCEQ | 23 |
| Procurement Methods | 23 |
| Evaluation Criteria | 23 |
| Subcontract Provisions | 24 |
| Payment Type | 24 |
| Oversight of Subrecipients and Vendors | 25 |



| | |
|---|----|
| Subcontractor Evaluations..... | 25 |
| Historically Underutilized Business..... | 25 |
| Contract Monitoring..... | 25 |
| Performance Self Evaluation..... | 26 |
| Risk Assessments | 26 |
| Desk Reviews..... | 26 |
| Site Visits | 26 |
| TCEQ Compliance Audits..... | 26 |
| Annual Independent Audit..... | 27 |
| Exhibit 1A. FY2024-2025 Budget Allocations | 28 |
| Exhibit 1B. Budget Categories and Documentation Required to Process Reimbursement Requests..... | 30 |
| Exhibit 1C. The Contract Administration File..... | 36 |
| The Contract Administration File | 37 |
| Exhibit 1D. Progress Report Format..... | 38 |
| Deliverable Status Template..... | 39 |
| Template for Activities Description | 40 |
| Template for the Monitoring Activities Report | 42 |
| Exhibit 1E. Personnel Eligibility List and Fringe Benefits Methodology..... | 45 |
| Personnel Eligibility List | 46 |
| Fringe Benefits Methodology | 47 |
| Exhibit 1F. Equipment Inventory Format | 48 |
| Exhibit 1G. Procurement System Certification | 50 |
| Exhibit 1H. Workplan Shell..... | 52 |

About Task 1

The administrative responsibilities and activities described in this task reflect the contract management and work plan development functions that are integral to the Texas Clean Rivers Program (CRP). The statutes and rules regarding CRP can be found in Section 26.0135 of Texas Water Code (TWC), Watershed Monitoring and Assessment of Water Quality and 30 Texas Administrative Code (TAC) Chapter 220, Regional Assessments of Water Quality, respectively. When using this guidance document, planning agencies should also refer to those sections of the TWC and TAC for additional information.

Contract Initiation and Development

Work Plan Development

The work plan, as defined in 30 TAC Section 220.2, outlines the scope of work, including time schedule and cost expenditures, from a planning agency to perform a service and provide a comprehensive regional assessment of the watershed. The work plan follows the format provided in Exhibit 1H “Work Plan Shell.” There are seven tasks outlining the work that will be conducted under the contract. Each task in the work plan contains the following sections: objectives, description of work that will be done under the task, and deliverables and their due dates.

Objectives—Define the purpose and intent of each task. Objectives are provided in the work plan shell. The planning agency should add other objectives to address basin priorities.

Task Description—Provide a detailed description of the work that will be done to accomplish the task objective(s) and complete the task’s deliverables. Describe the level of effort needed to meet task objectives and basin priorities.

Deliverables and Due Dates—Integrate the deliverables and associated due dates into each task. A list of the basic deliverables is provided in the work plan shell. The planning agency may add other deliverables as needed to accomplish the task and address basin priorities. The due dates included in the shell are set at times that ensure deliverables are received when they are needed to accomplish key objectives; however, certain due dates are negotiable during the work plan development process. Wherever possible, all deliverables need to have specific due dates to help track status.

Supporting Documentation

The following items are supporting documentation that will be used to evaluate the work plan and prepare the contract. These items must be submitted with the initial draft work plan. If necessary, this documentation may need to be revised and re-submitted with the final work plan. A spreadsheet containing all the pertinent supporting documentation will

be provided by the Texas Commission on Environmental Quality (TCEQ) CRP project manager to the planning agencies for use in developing budgets.

Table 1-1. Supporting Documentation Required

| Document Type | Documentation Description |
|---|--|
| Budget by Category | Use the budget categories shown in Table 1-2, Sample Budget Table, below to create the contract budget. See Exhibit 1A for each planning agency’s CRP allocation for the contract period. |
| Budget by Task | For each task, list the estimated amount that will be expended for each fiscal year. |
| Personnel Eligibility List (PEL) | List all employees whose salaries will be wholly or partially funded by the CRP. See Exhibit 1E for PEL and fringe benefits methodology. Add any special notes to ensure PEL information can be reconciled against payroll and personnel records (e.g., salaries estimated based on X, or salaries include projected pay increases). |
| Fringe Rate Methodology | List all the types of expenses that will be included to calculate the rate and show how those expenses are calculated. See Exhibit 1E for PEL and fringe benefits methodology. Provide date(s) when the fringe rate will be adjusted each year, if applicable. |
| Travel | List travel costs (within State rates) of transportation, lodging, meals, and related expenses for employees traveling on project business. |
| Supplies | List estimated costs for materials necessary to carry out the program, including equipment with a purchase price (including freight) of less than \$5,000. |
| Allocated Costs Documentation | For those planning agencies that have developed rates for the use of equipment, supplies, office space, telephone, printing, or computer services, etc., explain the method by which these expenses will be charged. |
| Equipment Inventory | List all the equipment that you plan to purchase within the biennium, as well as previously purchased equipment. Any additional purchases must have prior written approval from the TCEQ CRP project manager. |
| Subrecipients and Vendors | List all the tasks or subtasks (deliverables and lab support) that may be completed by a subrecipient or a vendor and the approximate cost for each. |
| Other | List direct cost items not identified and explained in the budget categories. |

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| Indirect Cost Rate Proposal | Describe the method for calculating reimbursement for indirect costs accompanied by required documentation. See Exhibit 1B for information on budget categories and documentation required to process reimbursement requests. |
| Certification of Procurement Process | A written certification that the planning agency’s procurement procedures conform to and reflect applicable state and local laws. Use the form provided in Exhibit 1G for the procurement system certification. |
| Training, Conferences, or Other Events | List any non-CRP training events, conferences, or other events in support of each task that are planned or expected. Any conferences, training, or other events not provided on this list must be approved by the TCEQ CRP project manager prior to incurring costs for such events. |

Budget Preparation

The cost reimbursement budget is the financial expression of the project as approved during the award process. This budget is included in the contract and will be subject to fiscal monitoring. It is the planning agency’s best estimate of the costs to successfully complete the contract deliverables at the time the contract is executed. It is necessary to submit budget and expense information for planning purposes, as shown in the example below.

Table 1-2. Sample Budget Table

| Budget Category | Total Allocation |
|------------------------|-------------------------|
| Personnel and Salaries | \$106,800 |
| Fringe Benefits (25%) | \$26,700 |
| Travel | \$9,000 |
| Supplies | \$6,000 |
| Equipment | \$21,000 |
| Contractual | \$57,000 |
| Other | \$64,000 |
| Total Direct Costs | \$290,500 |
| Indirect Costs (0%) | \$0 |
| TOTAL COSTS | \$290,500 |

The proposed budget, and supporting documentation justifying each line-item cost, is reviewed, revised, and agreed to by both parties (TCEQ and the planning agency) as part of the contract negotiations. For example, if the \$21,000 equipment cost is to purchase two pieces of equipment, a description of the equipment and estimated cost, identified by task,

must be specified. When developing the proposed budget, the planning agency must follow the latest [Texas Grant Management Standards \(TxGMS\)](#)¹ issued by the Comptroller of Public Accounts Statewide Procurement Division to determine allowable costs.

Items included in the “Equipment” category are typically \$5,000 or greater. Items of lesser cost, such as a computer, should be included in the “Supplies” category. As stated in Exhibit 1B, certain items that are less than \$5,000 are considered “controlled assets” and will need to be tracked on the planning agency’s Equipment Inventory.

Time Frame for Submission of Work Plan and Supporting Documentation

To ensure contracts are implemented at the beginning of the State of Texas fiscal year (FY), a time frame for submission, review, and approval is outlined below for the fiscal year prior to the new biennium (e.g., FY24-25 contracts are developed in FY23).

Table 1-3. Time Frames for Work Plan and Documentation

| Date or Date Range | Stage of Work Plan |
|---------------------------------|---|
| December 15 | Work plan and supporting documentation due to TCEQ CRP project manager |
| January 15 | TCEQ CRP project manager’s comments sent to planning agency |
| January 15 to February 1 | Planning agency addresses comments |
| February 1 | Planning agency submits final work plan, list of deliverables, and revised supporting documentations (if necessary) |

Deliverables and Due Dates

Review of Deliverables by TCEQ

The TCEQ CRP project manager requires *30 days to review* deliverables received from a planning agency and either approve them as is or request revisions. Deliverables should be submitted by the due date specified in the contract. In the event a deliverable is submitted late, an extension was not requested, and the TCEQ CRP project manager does not have 30 days to review it before the associated reimbursement request is received, then the reimbursement request may be rejected and reconsidered 30 days after the delinquent deliverable is received. If the deliverable is incomplete or requires revision, then the

1. comptroller.texas.gov/purchasing/docs/grant-management-reader.pdf

reimbursement request may be rejected until the deliverable is approved. Few deliverables are exceptions to this process.

If a revised due date for a deliverable has been approved by the TCEQ CRP project manager in advance of the due date, then the deliverable is not considered late on the original due date. If a deliverable deadline is extended, reimbursement will be made on the final deliverable after the deliverable is reviewed and approved by the TCEQ CRP project manager.

All deliverables must follow CRP guidelines and format, as stated in this guidance, and must be of acceptable quality before the deliverable is considered complete and reimbursement requests will be processed. The planning agency must address all comments provided by TCEQ staff before submitting the revised deliverable to the TCEQ CRP project manager.

Requesting Extension of a Due Date

In general, due dates for deliverables specified in the contract should be met and only revised if there is an exceptional circumstance. When a deliverable cannot be completed and submitted to TCEQ on or before the due date, it is the planning agency's responsibility to inform the TCEQ CRP project manager as soon as possible prior to the due date. At least one week before a deliverable is due, the planning agency must submit a letter or e-mail stating: the reason for delaying a deliverable, the anticipated completion date, justification for extending the due date, and any other pertinent information. The TCEQ CRP project manager will approve or disapprove this request. If the request is not approved the deliverable will be considered late when the original deadline elapses. If the extension is approved, an email stating approval and referencing the change will be transmitted to the planning agency to confirm the approval. The project manager and planning agency will include the documentation in their contract file. The progress report for the period must summarize the status of the delayed deliverable(s), indicate the date TCEQ provided approval of the extension, and specify the anticipated and actual submittal date. Multiple requests for revised due dates could necessitate a contract amendment or other action(s).

Progress Reports

Progress reports (see example in Exhibit 1D) serve as an important form of documentation of task activities and as a deliverable-tracking system. The progress report summarizes the planning agency's activities for each task, tracks monitoring activities, problems, delays, and outlines the status of each task's deliverables. The progress report is due by the 15th day of the month following the end of each quarter. The last progress report for the biennium is due on August 15 because the contract cannot include deliverables outside the contract period. The progress report and attached documentation of activities conducted during the quarter are considered deliverables for the quarter they represent, and activities related to each invoiced expense should be represented on the progress report.

Format and Contents

The progress report contains four sections: Deliverable Status, Description of Activities, Monitoring Activities, and Data Submittal Progress.

The Deliverable Status form lists all deliverables (in order by date due) and provides specific information on submittal dates and circumstances regarding the status of each deliverable. If a due date is revised, the planning agency must keep the original due date in the Date Due column and indicate the new due date in the Comments column, along with the date the TCEQ CRP project manager approved the revision.

The Description of Activities form enables the planning agency to provide a detailed narrative of activities conducted under each task for each quarter. This information is important to provide a description of the types of activities and level of effort conducted under each task for a specific quarter. Even if there is no deliverable directly associated with an activity, the work or activity needs to be described under the most appropriate task so that expenses related to those activities can be approved.

The Monitoring Activities form details the number of sites visited and types of samples taken during the quarter. If a sampling event did not take place as scheduled, the reason why and the anticipated make-up date (if applicable) must be provided. Descriptions of these occurrences and a discussion of any special studies (or other monitoring activities) can be provided on the Description of Activities form.

The Data Submittal Progress Report provides a status of all data submitted to the TCEQ project manager from the beginning of the biennium, the end of each quarter, and up to the end of the biennium. A template of the Data Submittal Progress Report is provided in Exhibit 4F and should be completed by the planning agency. Information included in the report is important for both the planning agency and TCEQ CRP project manager to use to track data submittals and ensure all qualifying data are submitted to TCEQ and finalized in the Surface Water Quality Monitoring Information System (SWQMIS).

Conference Calls

Conference calls are an important method of communication for the CRP. It is important for each planning agency to have a representative (e.g., primary or backup representative) present for each call. If a planning agency is unable to participate in a conference call, they should notify the TCEQ CRP project manager that they will not attend. The planning agency will then be responsible for contacting the project manager for the missed information.

Training Events and Conferences

TCEQ may offer training courses throughout the contract period. Planning agencies are encouraged to take advantage of these courses. It is advisable to consider at least two training events per year with TCEQ when developing budgets and work plans.

To a limited extent, in-kind program participants may participate in TCEQ training events, however, pre-approval must be obtained from the TCEQ CRP project manager beforehand. Because of factors such as limited space, cost, etc., pre-approval is necessary to ensure the training is efficient and effective. When factors are not limiting, in-kind participants are encouraged to participate in TCEQ sponsored training, although their expenses (e.g., travel, time, meals) cannot be reimbursed using CRP funds.

Charges associated with training or conferences other than those hosted by the CRP are allowable if the event provides a benefit to the program. Such training events or conferences must be requested with the work plan, or otherwise be pre-approved by the TCEQ CRP project manager. If a training event is not pre-approved prior to incurring costs associated with the event, costs may not be reimbursed.

Reimbursement Procedures

The TCEQ reimbursement schedule is based on the State of Texas FY (September 1- August 31). Reimbursement of expenses will be made on a quarterly basis. It is the responsibility of the planning agency to ensure that TCEQ representatives named in the contract and WQPDInv@tceq.texas.gov receive accurately completed reimbursement requests and required supporting documentation; however, invoices must be submitted to WQPDInv@tceq.texas.gov. When forms or documentation are incomplete, incorrect, illegible, or if deliverables have not been received by the due date, reimbursement request processing may be delayed (e.g., invoice rejected).

The set of tables in Exhibit 1B describes each budget category and the documentation required for processing a reimbursement request. These tables are an especially useful resource when preparing to submit a reimbursement request to TCEQ; however, the planning agency should refer to the contract for additional information regarding the documentation that is required with reimbursement requests.

Due Dates

Quarterly Reimbursement

The planning agency's reimbursement request is due to TCEQ within 30 days after the close of each quarter as specified in the contract. The timely receipt of accurate reimbursement requests is a performance measure used in the annual performance evaluation.

Final Payment

The final reimbursement request is due to TCEQ no later than 45 days following the termination date of the contract. TCEQ has the authority to refuse payment for any costs incurred within the term of the contract which are not submitted within 45 days after the termination date of the contract.

As a condition for final payment, the planning agency will execute and deliver to TCEQ a written release of all claims against TCEQ arising under this contract.

Reimbursement Request and Review

TCEQ authorized representatives check the expenses on each reimbursement request against the progress report among other things to determine the applicability and allowability of costs. It is recommended that the planning agency establish an internal system to review its reimbursement request prior to submission. If all required forms and documentation are received on time and are correct, TCEQ authorized representatives will process the reimbursement request.

The following items are required before a reimbursement request can be processed:

- All required financial reimbursement forms have been received, and the forms are legible, signed and dated, and completed correctly.
- Expenses for activities correlate with the reported activities in the progress report.
- All expenses are described and allowable, with supporting documentation (Exhibit 1B).
- Level of effort certification form in accordance with the contract are submitted when contractually required.
- There is no deficit balance for any cost category that shows zero budgeted funds.
- All water quality monitoring activities, including special studies, are conducted under an approved Quality Assurance Project Plan (QAPP).
- All deliverables are submitted to TCEQ that were due within, and up to, this expense reimbursement period and have been approved by the TCEQ CRP project manager.

- Documentation indicating approval by the TCEQ CRP project manager of an extension to a deliverable due date (e.g., copy of email or letter responding to planning agency's request).
- Final reimbursement request is accompanied by a release of claims letter to TCEQ.

Documentation Required for Allowable Cost Categories

The planning agency will maintain documentation to show the work performed is a justifiable CRP activity, and that the expense was paid by the planning agency. See Exhibit 1B for information on budget categories and documentation required to process reimbursement requests). The planning agency will make available for review, during fiscal compliance monitoring and upon request by TCEQ staff, the financial information and data used by the planning agency or its designee (including independent financial auditors) in the preparation or support of any cost submission or cost (direct and indirect) including, but not limited to, receipts and invoices.

Allowable and Unallowable Costs

TCEQ uses TxGMS to review the proposed budget and reimbursement requests to ensure only allowable costs are charged to the CRP. Information regarding general principles for determining allowable costs can be found in TxGMS.

It is the responsibility of the planning agency to be familiar and in compliance with TxGMS. The planning agency should contact their TCEQ CRP project manager regarding questions of allowability or allocability. A more complete description of allowable and unallowable costs is contained in TxGMS on the Internet.

Direct costs are all costs which can be directly related to performance of the contract activities.

Indirect costs are those that have been incurred for common or joint purposes which cannot be readily identified to a particular contract without a disproportionate effort. See Exhibit 1B, Indirect Costs column, for further description of requirements for applying indirect costs to the budget.

A related, but separate concept is the allocation of shared costs. These costs are typically assigned to the use of equipment or space and are charged based on the amount of use (e.g., number of sampling trips, number of copies, number of square feet of office space). These costs are typically listed in the "Other" category on the Financial Status Report (FSR).

TCEQ will only reimburse the planning agency for allowable costs considered reasonable and necessary to carry out the grant contract activities. Water quality monitoring activity costs are allowable only if they are conducted under a CRP approved QAPP. An allowable cost may not be

a reimbursable cost if there is no line-item cost approved in the budget or described in the contract.

Unallowable and Non-reimbursable Costs

If an unallowable cost is submitted, that cost is deducted from the requested reimbursement amount before the request is processed. The following is a list of some, but not all, unallowable and non-reimbursable costs which will not be reimbursed by TCEQ. This is not an all-inclusive list.

- Contingencies (contribution to reserve)—excludes contributions to self-insurance fund, pension plan reserves, post-retirement health and benefit.
- Contributions and Donations—include cash, property, and services, by governmental units to others, regardless of the recipient.
- Defense and prosecution of civil or criminal proceedings (exceptions).
- Insurance deductibles, including those for motor vehicles.
- Entertainment.
- Food that is not reimbursed as a part of travel expenses.
- Volunteer lodging or transportation expenses.
- Fines, Penalties, or Interest.
- Fund raising and investment management (exceptions).
- Indirect or direct costs unsupported by required documentation.
- Lobbying expenses.
- Gratuities and tips.
- Travel costs that exceed the State of Texas reimbursement rates and guidelines.
- Use costs associated with equipment purchased with program or agency funds (e.g., mileage costs for a vehicle purchased with program funds, use costs for sondes purchased by TCEQ).

Reimbursable Costs

The following planning agency costs are allowable, approved line-item costs incurred during the time period indicated on the FSR (TCEQ Form 20248):

- Costs paid prior to claiming reimbursement from TCEQ— “CASH METHOD.”
Examples: supplies purchased at an office supply store with a check or monthly salaries paid on the last day of the time period
- Costs incurred by the last day of the time period and **paid no later than 45 days after the end of the time period**— “ACCRUAL METHOD.”
Examples: supplies purchased and charged to the planning agency credit card on the last day of the time period (planning agency pays credit card bill in full on the 25th of each month).
- Monthly salaries paid on the first day of the month after the end of the period.

Questioned or Disallowed Costs

Any reported cost may be questioned by the TCEQ CRP project manager to determine whether it is allowable. A questioned cost will be referred to the planning agency’s CRP project manager for clarification and may be disallowed if sufficient justification is not provided. A disallowed cost is one that is not allowable according to TxGMS, not specified in an executed contract, or cost for which there is no approved budget line-item. A quarterly reimbursement request, desk review, or an on-site fiscal monitoring visit may result in either questioned or disallowed costs.

The planning agency may accept or dispute any questioned or disallowed cost. If the planning agency accepts the disallowance, they must inform the TCEQ CRP project manager of this acceptance. Non-response within 30 days of notification by TCEQ will indicate acceptance of the disallowance (including questioned cost). If the planning agency elects to dispute the disallowance, the planning agency must submit additional written justification and documentation to the project manager within 30 days of notification. If upon further review, TCEQ allows the cost, the project manager will inform the planning agency of the procedure to obtain reimbursement.

If the disallowed or questioned cost is disallowed after the additional submitted documentation is reviewed, the TCEQ CRP project manager informs the planning agency in writing of the disallowance. The planning agency may submit a written request to TCEQ Water Quality Planning Division (WQPD) Deputy Director to review the decision. The Deputy Director will review the documentation within 30 days and either allow or disallow the disputed cost.

Contract Management

Contract Changes

The planning agency may request a modification to the existing contract by submitting a written request to the TCEQ CRP project manager. The request must include the proposed modification and its purpose in the appropriate format, and if affected by the modification, a revised budget, or a scope of work for the affected task(s). Note that contract modifications can only be made prior to the contract expiration date.

Generally, a major change will require an amendment to the contract and may include one or more of the following:

- An increase or decrease in the TCEQ obligation amount.
- An extension or shortening of the term of the contract.
- A significant change in the scope of work.

An amendment will include a description of the proposed modification(s) and must be reviewed by the TCEQ CRP project manager and other TCEQ staff and approved by authorized representatives from TCEQ and the planning agency.

After receiving the written amendment request, TCEQ will draft an amendment describing all changes. The amendment documentation will be sent to the planning agency for review and approval. After the planning agency has signed the amendment, it should be returned to the TCEQ CRP contract manager, who will obtain a signature from the authorized TCEQ representative. A final signed copy will be provided to the planning agency for their records.

A minor change will require the written agreement (e.g., email) of both TCEQ's and the planning agency's authorized representatives. A copy of the agreement approving the minor change will be sent to the planning agency for its records. An extension of a deliverable due date, if approved by the TCEQ CRP project manager, is an example of a minor change; however, multiple due date extension requests could require an amendment.

Budget Revisions

It is the planning agency's responsibility to regularly compare actual costs to budgeted costs and inform the TCEQ CRP project manager of potential budget revisions. Budget line-item revisions often occur as a project progresses due to changing conditions, more accurate estimates of work, additional supplies required, and so on. Moving funds between budget categories will require TCEQ pre-approval before a budget revision request (BRR) is created and submitted to TCEQ. The planning agency should submit a pre-approval request in writing (e.g., e-mail) to the project manager. If the BRR is pre-approved, a BRR form, signed by the planning agency's authorized representative, must be completed and

submitted to the project manager. No budget change is effective until it is signed by TCEQ's designated representatives. Budget revisions should be limited and submitted only as needed, but not more frequently than quarterly. In some circumstances, a budgetary change may require a contract amendment.

Procurement of Subrecipients or Vendors

The use of sources other than the planning agency to complete portions, or all, of the CRP contract involves several steps to define how procurement, subcontract provisions, payment and oversight will be handled. These steps are complex, and there are many instances where errors can be introduced into the process. Proper planning will reduce or eliminate the risk of error. Effective contract management is dependent on the interaction of the following elements:

- Plan—Identify contracting objectives and contracting strategy.
- Procurement—Fairly and objectively select the most qualified contractors.
- Rate and Price Establishment—Establish processes that are cost effective and aligned with the cost of providing the goods and services.
- Contract Formation—Ensure the contract contains provisions that hold the contractor accountable for producing desired results.
- Contract Oversight—Monitor and enforce the terms of the contract.

The [*State of Texas Procurement and Contract Management Guide*](#)² generally describes the steps and elements and provides practical suggestions and best practices for contracting. The planning agency may reference the current version of the *State of Texas Procurement and Contract Management Guide*, available on the Texas Comptroller's website, for additional information.

Subrecipient and Vendor Determinations

Please note that contractual relationships vary and there may be different limitations and requirements associated with procured subcontractors versus awarded subgrantees. In classifying applicable partners as subrecipients or vendors, please reference 2 CFR § 200.331 on subrecipient and contractor determinations for guidance in differentiating between grants and procurements.

Procurement Procedures

There is no single “right” way to contract. Various types of purchases and contracts may require different practices, processes, and strategies for successful implementation. The planning agency should use its own procurement procedures that comply with applicable

2. comptroller.texas.gov/purchasing/docs/96-1809.pdf

state and local laws and regulations. The procurement procedures must be available for review during on-site visits and may be audited or requested at any time by TCEQ.

Procurement Deliverable to TCEQ

The planning agency's procurement procedures and solicitation documents for subcontracts are not deliverables to TCEQ, however, the TCEQ CRP project manager needs some subcontract information to adequately administer a contract and review invoices. The project manager may request a planning agency to submit technical specifications on proposed procurements, so it is important for the project manager and planning agency to communicate in advance about any subcontract plans. In addition, the following information will be sent to the project manager upon the planning agency's execution of subcontracts:

- Procurement method used (e.g., invitation for bids (IFB), request for proposals (RFP)—with or without prices, request for qualifications (RFQ)).
- List of tasks to be performed by subrecipient.

TCEQ may request additional procurement or subcontract documentation to be submitted during a desk review. See Exhibit 1C for guidelines to establish a master contract administration file.

Procurement Methods

The procurement method chosen will be a major factor affecting time and steps in the planning process for developing subcontracts. The planning agencies may reference the *State of Texas Procurement and Contract Management Guide* to assist in the selection of the appropriate procurement type. After the procurement method is determined, the solicitation document is prepared. The *State of Texas Procurement and Contract Management Guide* provides information about preparing solicitations.

Evaluation Criteria

The solicitation document (e.g., IFB, RFP, RFQ) will instruct the respondents on how subcontract proposals will be evaluated. The evaluation criteria must reflect the essential qualities or performance requirements necessary to achieve the objectives of the subcontract. The criteria should allow the proposals to be fairly evaluated. The *State of Texas Procurement and Contract Management Guide* provides a sample evaluation criterion. The planning agency must maintain documentation for each procurement showing the best subcontractors were fairly and objectively selected. The planning agency must maintain documentation for each procurement showing the best subcontractors were fairly and objectively selected.

Subcontract Provisions

There are many provisions that are necessary for any subcontract. Certain considerations should be addressed before proceeding with a contract or agreement. For instance, when acquiring data management, website development, or mapping services, clauses regarding intellectual property, data, and publicity are absolutely necessary. The subcontract should also include payment and oversight provisions. A list of suggested provisions is provided below. These provisions must be evaluated individually for any subcontract to determine their applicability. The *State of Texas Procurement and Contract Management Guide* explains general rules regarding contract formation and essential clauses, and the Appendices provide sample contract terms, but these resources do not replace the advice of an attorney, nor do they replace any statutory requirements of the planning agency. **ALWAYS CONSULT AN ATTORNEY FOR LEGAL ADVICE CONCERNING CONTRACTS.**

Suggested subcontract provisions:

- Agreement Term
- Laws and Rules
- Quality Assurance and Project Planning Intellectual Property
- Data and Publicity Lobbying Activities Performance Evaluation
- Total Obligation Amount Costs and Payments Safety and Protection
- Title to and Management of Equipment Records Access and Audit
- Insurance, Liability, and Indemnification
- Procurement, Subcontracts, and Subgrants

Payment Type

The payment type must be sufficient to ensure the planning agency pays fair and reasonable prices for services. Payments should be structured to fairly compensate the contractor and encourage timely and complete performance of work. Payments should be approximately equal to the value of the completed work and should be in accordance with the contract rate schedule. A description of the different payment types is located in the *State of Texas Procurement and Contract Management Guide*.

The circumstances of the procurement may impact the payment type that may be used. Specifically, a cost analysis must be performed for professional, consulting, and architectural or engineering services contracts, sole source procurements, and a cost analysis must be performed when adequate price competition is lacking, such as intergovernmental contracts with universities or local governments. Invoices for these subcontracts must show actual costs like those listed on the FSR, including profit for private entities. Profit, if applicable, must be listed as a fixed amount at the beginning of the contract and not a multiplier based on another cost.

Oversight of Subrecipients and Vendors

The planning agency is responsible for assuring the subcontractor's compliance with performance and fiscal requirements outlined in applicable laws, regulations, and the subcontract itself. The oversight of subcontractors must be sufficient to ensure public funds are spent effectively and efficiently for quality services. The *State of Texas Procurement and Contract Management Guide* contains general administration and oversight processes. See Exhibit 1C for guidelines to establish a master contract administration file to document these processes.

Subcontractor Evaluations

Planning agencies will be required to submit to TCEQ, performance evaluations of subcontractors performing work under CRP. The [Contractor Evaluation Form](#)³ will be completed and submitted at the end of each state fiscal year during the contract term to document the performance of subcontractors.

Historically Underutilized Business

TCEQ encourages the use of historically underutilized business (HUB) participation in procurement and contracting processes and recommends the planning agency make a good faith effort to assist HUBs in receiving contract awards issued by the State. A good faith effort demonstrates that equal opportunity is provided to underutilized minority and women-owned business enterprises in procurement and vendor purchases. Although it is recommended that planning agencies try to acquire services, supplies, and equipment through a certified HUB vendor, there are no reporting or tracking requirements for state-funded contracts.

Contract Monitoring

Fiscal monitoring includes a review of financial information to determine fiscal integrity and compliance with fiscal, state, and contractual requirements. It ensures state funds are spent properly and accurately accounted for, deliverables are received on schedule, contractor performance is evaluated, deficiencies are corrected, and invoices are adequately supported by reasonable assurance that TCEQ received what it expected and was paid appropriately. A risk-based approach dictates that not every transaction requires 100 percent scrutiny. By performing desk reviews and on-site fiscal monitoring visits, TCEQ can allow contractors to provide limited back-up documentation with its reimbursement requests and maintain the documentation for periodic review during desk reviews or site visits.

3. www.tceq.texas.gov/downloads/water-quality/clean-rivers/forms/20979.pdf

Performance Self Evaluation

As recommended by the State Auditor's Office TCEQ CRP project managers will evaluate planning agencies annually, using the Contractor Evaluation Form. This form will be utilized by TCEQ staff in establishing a risk-based methodology for prioritizing and tailoring desk and on-site fiscal reviews. The planning agency should use the form to do a self-evaluation and send a copy to its TCEQ CRP project manager. The TCEQ CRP project manager will then evaluate the planning agency. A copy of the completed evaluation will be sent to the planning agency, which may send its written comments on the evaluation to their TCEQ CRP project manager. The planning agency may request a meeting with their project manager to discuss the evaluation.

Risk Assessments

TCEQ performs a risk assessment of contractors to establish monitoring work schedule priorities for each fiscal year. The planning agencies may be monitored annually by either a desk review or a site visit, based upon the risk assessment.

Desk Reviews

Annual submission documentation is reviewed in-house by the Division Support Section in the Water Quality Planning Division. Planning agencies will be notified 30 days before the invoice due date when they must provide the additional supporting documentation listed in the tables in Exhibit 1B. The TCEQ notice of the desk review will specify the documentation each planning agency must provide. It is important to read the notice as some desk reviews may not require all the information listed in Exhibit 1B. Planning agencies scheduled for a site visit will not be required to have a desk review that year.

Site Visits

Based upon the risk assessment, some planning agencies will be scheduled for a contract fiscal monitoring site visit. An on-site visit involves a thorough review of records for one or more quarters to verify accuracy of reporting and adequacy of fiscal management processes.

TCEQ Compliance Audits

The TCEQ Chief Auditor Office may elect to conduct an audit of financial and program records of individual planning agencies throughout the contract period.



Annual Independent Audit

All planning agencies that receive a combined total greater than \$750,000 from the federal government and Texas state government agencies are required to have an annual independent audit conducted pursuant to applicable state law, regulations, and policies (TxGMS), State of Texas Single Audit Circular). TWC, Section 49.195 requires river authorities and water districts to submit an annual independent financial audit to the TCEQ Water Supply division.



Exhibit 1A.

FY2024-2025 Budget Allocations



Table A-1. FY2024-2025 Budget Allocations

| Planning Agency (Basin Number) | FY2024 | FY2025 | Total Allocation |
|---|--------------------|--------------------|-------------------------|
| Brazos River Authority (12) | \$474,088 | \$474,088 | \$948,176 |
| Guadalupe-Blanco River Authority (17 and 18) | \$161,195 | \$161,195 | \$322,390 |
| Houston-Galveston Area Council (9, 10, 11, 13) | \$1,149,758 | \$1,149,758 | \$2,299,516 |
| International Boundary & Water Commission (23) | \$318,217 | \$318,217 | \$636,434 |
| Lavaca-Navidad River Authority (16) | \$118,234 | \$118,234 | \$236,468 |
| Lower Colorado River Authority (14 and 15) | \$454,606 | \$454,606 | \$909,212 |
| Angelina & Neches River Authority and Lower Neches Valley Authority (6 and 7) | \$392,652 | \$392,652 | \$785,304 |
| Northeast Texas Municipal Water District (4) | \$118,234 | \$118,234 | \$236,468 |
| Nueces River Authority (20, 21, and 22) | \$308,279 | \$308,279 | \$616,558 |
| Red River Authority of Texas (1 and 2) | \$370,448 | \$370,448 | \$740,896 |
| San Antonio River Authority (19) | \$235,485 | \$235,485 | \$470,970 |
| Sabine River Authority (5) | \$372,777 | \$372,777 | \$745,554 |
| Sulphur River Basin Authority (3) | \$118,233 | \$118,233 | \$236,466 |
| Trinity River Authority (8) | \$468,269 | \$468,269 | \$936,538 |
| TOTALS | \$5,060,475 | \$5,060,475 | \$10,120,950 |



Exhibit 1B. Budget Categories and Documentation Required to Process Reimbursement Requests

Table B-1. Budget Categories and Documentation Required to Process Reimbursement Requests

| Budget Category and Description | Documentation for Reimbursement Request | Documentation for Site Visit or Desk Review |
|--|--|--|
| <p>Personnel and Salary: Compensation of employees for the time devoted to the performance of CRP tasks.</p> <p>Reference: TxGMS</p> | <p>Personnel and Salary Supplemental form listing:</p> <ul style="list-style-type: none"> • Employee name • Title and position • CRP salary for the period • Task number(s) worked • Level of effort certification as applicable and in accordance with the contract <p>Time sheets only required if stated in contract.</p> <p>Submit Personnel Eligibility Lists (PEL) annually with first quarter invoices or with the quarter's invoice when employment status changes occur (e.g., hire date for new employees and date last employed on project for employees no longer working on project).</p> <p>Include special notes to ensure PEL information can be reconciled against payroll and personnel records (e.g., salaries are estimated based on X, or salaries include projected pay increases).</p> | <p>Time Sheets must:</p> <ul style="list-style-type: none"> • Reflect an <i>after-the-fact distribution</i> of actual activity. • Account for <i>total activity</i> for which the employee is compensated. • Be prepared at least monthly and must coincide with one or more pay periods. • Be <i>signed</i> by the employee and supervisory official having firsthand knowledge of the worked performed. <p><i>Reports from electronic timekeeping systems must meet the above standards.</i></p> <p>Charges for salaries should match <i>payroll documentation</i>.</p> <p>Personnel files and policies must be available for on-site or desk reviews.</p> |
| <p>Fringe Benefits: Costs of leave, insurance, Social Security, and Medicare contributions, pensions, unemployment benefit plans, etc.</p> <p>References: TxGMS and CRP Contract Authorized Expense Budget</p> | <p>Show calculation on Personnel and Salary Section of Supplemental form using the most recent approved rate or specify if benefits are adjusted to actual. No additional documentation is required with the reimbursement request.</p> | <p>Itemize employee benefits with percentages or cost for each employee listed on the PEL. Benefits must be granted according to established written policies which should be available for on-site or desk reviews.</p> |

| | | |
|---|---|---|
| <p>Travel: Costs (within the rates allowed by the State) of transportation, lodging, meals, and related expenses for employees (on the PEL) traveling on CRP business.</p> <p>References: TxGMS and the State of Texas Travel Allowance Guide⁴</p> | <p>Travel Supplemental form listing:</p> <ul style="list-style-type: none"> • Name of Traveler • Date(s) of travel • Destination and purpose of travel, including titles of workshops, training, or meetings • Mode of transportation (personal car, agency vehicle, rental car, airplane, etc.) • Costs for meals, lodging, and transportation (including mileage) <ul style="list-style-type: none"> ▪ Receipts are not required unless requested ▪ Travel expenses for volunteers will not be reimbursed • Task(s) to which each activity applies | <p><i>Copies of receipts</i> for hotel accommodations, public transportation, airfare, rental cars, and meals (when available), etc. A signed and approved travel reimbursement invoice may be provided if all the required information is recorded.</p> <p><i>Mileage logs</i> for planning agency vehicles used for CRP travel should be available for on-site or desk reviews. Mileage logs should clearly indicate the mileage and locations of travel for CRP activities and be verifiable via an online mapping tool (e.g., MapQuest).</p> <p><i>Travel policies</i> should be available for on-site or desk reviews.</p> |
| <p>Supplies: Costs for materials necessary to carry out the program. This includes equipment with a purchase price (including freight) of less than \$5,000.</p> <p>Examples: Chemicals and Gases, Fuels and Lubricants, Computer Software and Supplies, Office Supplies, Medical Supplies, Cameras, Computers, Furniture.</p> <p>The CRP has designated certain supplies purchases to be controlled assets which need to be added to the planning agency’s Equipment Inventory, such as:</p> | <ul style="list-style-type: none"> • Supplies Supplemental form listing materials and supplies purchased for the program. • Provide sufficient description of the item(s) to enable TCEQ to determine the applicability of the cost. • <i>No receipts are required</i> to be submitted unless TCEQ requests records to verify allowability. • Update equipment inventory list when item has a serial number and an effective life of more than one year. • Food and drinks are not considered supplies and must be submitted as “Travel” expenditures. | <p><i>Copies of purchase orders or vendor-submitted invoices</i> marked received, approved for payment, with date received, category and funding source charged to, date of payment, or <i>copy of check</i>.</p> <p>Written justification and <i>calculation worksheets</i> must be available for costs</p> |

4. www.gsa.gov/portal/content/104877

| | | |
|--|--|---|
| <p>Computers, Digital Projectors, Cameras, GPS Receivers, Laboratory Equipment, Monitoring equipment (Multiprobes, flow meters, etc.)</p> <p>References: TxGMS and the State of Texas Purchase Policies and Procedures Guide⁵</p> | | |
| <p>Other: Direct cost items not identified and explained in the above categories.</p> <p>Examples: rent, laboratory expenses, utilities, telephone, data processing services, printing and reproduction, postage and shipping, contract clerical or other personnel, contract certified public accountant or bookkeeping services, janitorial services, exterminating services, security services, insurance and bonds, equipment repairs or services, books, periodicals, memberships.</p> <p>References: TxGMS and the State of Texas Purchase Policies and Procedures Guide</p> | <p>Other Supplemental form listing:</p> <ul style="list-style-type: none"> • Description of item • Itemization should be sufficient to allow TCEQ to determine the allowability of costs (e.g., three months’ rent @ \$ per mo.; or cost per # of bacteria analyses) <p>No receipts are required to be submitted with the invoice unless TCEQ requests records to verify allowability.</p> | <p><i>Copies of purchase orders or vendor-submitted invoices marked received, approved for payment, with date received, category and funding source charged to, date of payment, or copy of check.</i></p> <p>Written justification and <i>calculation worksheets</i> must be available for costs allocated between two or more funding sources.</p> <p><i>Procurement records and procedures</i> must be available for on-site and desk reviews.</p> |

5. fm.xcpa.texas.gov/fm/pubs/purchase/08/

| | | |
|--|---|---|
| <p>Equipment: Tangible, nonexpendable property having a useful life of more than one year and an acquisition cost of \$5,000 or more.</p> <p>References: TxGMS and the State of Texas Purchase Policies and Procedures Guide</p> | <p>Equipment Supplemental form listing:</p> <ul style="list-style-type: none"> • Description of equipment • Serial # • Unit cost and Total cost • <i>Receipts are required</i> for costs itemized in this category; in lieu of a receipt, a purchase order, an invoice (marked paid), a canceled check, or other evidence of payment must be submitted • Submit an updated <i>Equipment Inventory</i> for all additions and changes <p>NOTE: TCEQ may disallow the cost of equipment purchased without prior approval. Contact TCEQ for disposition instructions when equipment needs to be replaced or is no longer needed for the program.</p> | <p><i>Subcontracts or purchase orders</i>, and vendor- submitted invoices marked received, approved for payment, with date received, category and funding source charged to, date of payment, or copy of check.</p> <p><i>Procurement records</i>, including solicitations and selection documentation, and procurement procedures must be available for on- site and desk reviews.</p> <p>The planning agency is responsible for ensuring its subcontractors maintain and submit all reimbursement documentation required for financial monitoring or audit.</p> |
| <p>Contractual: Costs include those services or consulting that are provided by a firm or individual, not employed by the planning agency, and are not covered under the “Other” category.</p> <p>References: TxGMS and the State of Texas Procurement and Contract Management Guide⁶</p> | <p>Contractual supplemental forms listing all subcontractor costs either incurred or paid during the period, including:</p> <ul style="list-style-type: none"> • Contractor name • Description of activities performed • Date(s) performed • Cost • Related tasks <p>If costs are documented by more than one invoice for a contractor (e.g., monthly), list them separately. The TCEQ CRP project manager may request additional supporting documentation, including documentation of procurement, to verify allowability of costs.</p> | <p><i>Subcontracts or purchase orders</i>, and vendor-submitted invoices marked received, approved for payment, with date received, category and funding source charged to, date of payment, or copy of check.</p> <p><i>Procurement records</i>, including solicitations and selection documentation, and procurement procedures must be available for on- site and desk reviews.</p> <p>The planning agency is responsible for ensuring its subcontractors maintain and submit all reimbursement documentation required for financial monitoring or audit.</p> |

6. comptroller.texas.gov/purchasing/publications/procurement-contract.php

| | | |
|---|--|---|
| | | <p>Subcontractors' documentation must be available for on-site and desk reviews, and upon request by TCEQ. The planning agency must monitor its subcontractors to ensure they meet the requirements of the contract.</p> |
| <p>Indirect Costs: Costs incurred for a common or joint purpose benefitting more than one cost objective and not readily assignable to specific cost objectives without disproportionate effort.</p> <p>References: TxGMS and Contract Budget</p> | <p>Financial Status Report (TCEQ 20248) specifying the authorized rate and including a total cost not exceeding the rate authorized in the contract.</p> | <p><i>Option 1: Approved rate agreement</i>—a rate that has been determined by a state coordinating agency or may be negotiated and agreed on by the Parties.</p> <p><i>Option 2: 10%</i> of direct salaries (excluding fringe). No supporting documentation is required.</p> <p><i>Option 3:</i> No indirect costs, direct bill all costs.</p> |



Exhibit 1C.

The Contract Administration File

The Contract Administration File

Keeping one complete master contract administration file is critical. The CRP partner's file will provide a basis for settling claims and disputes should they arise in administrative or court actions. TCEQ may request review of these items during contract fiscal monitoring desk reviews or site visits. Throughout the life of the contract, the contract administration file should contain such things as:

- A copy of the current contract and all modifications.
- A reference list or a list of prior contracts with a specific vendor (if they offer valuable historical data).
- A list of contractor submittal requirements.
- A list of government furnished property or services.
- A list of all information furnished to the contractor.
- A copy of the pre-award conference summary, if conducted.
- A schedule of compliance review, internal correspondence, if applicable.
- The originals of all contractor data or report submittals.
- A copy of all routine reports required by the contract such as sales reports, pricing schedules, approval requests, and inspection reports.
- A copy of all notices to proceed, to stop work, to correct deficiencies, or change orders.
- A copy of all letters of approval pertaining to such matters as materials, the contractor's quality control program, prospective employees, and work schedules.
- The records and minutes of all meetings, both internal and external. Include sign-in sheets or agendas.
- A copy of all contractor invoices, information relative to discount provisions for prompt payment, letters pertaining to contract deductions or fee adjustments.
- A copy of all backup documentation for contractor payment or progress payment; and copies of any audits.



Exhibit 1D. Progress Report Format



Deliverable Status Template

Instructions: List deliverables in order of due date. Include information about the deliverable’s status and whether or when extensions were requested. Example:

Table D-1. Deliverable Status Report, FY 24 Quarter 1, Sept. 1, 2023 through Nov. 30, 2023

| Task | Task Description | Date Due | Date Submitted | Comments |
|------|---|--------------------|----------------|---|
| 2A | Basin-wide QAPP receipt and adherence letters | 10/15/23 | 10/15/23 | 3 of 3 QAPP participants signed letters; emailed these to TCEQ. |
| 2B | Posted specified sections of the basin-wide QAPP online | 10/31/23 | 10/31/23 | Emailed copy of updated webpages to TCEQ. |
| 6C | Contact Steering Committee members with questionnaire, draft agenda, and to confirm participation | 10/31/23 | 10/31/23 | Copy of questionnaire and draft agenda was submitted via email for 12/15 meeting. |
| 5A | Preparation meeting for Basin Summary Report | 11/15/23 | 10/20/23 | Meeting held at TCEQ office in Austin on 10/20. |
| 6D | Final announcements and agenda for Steering Committee meeting | 11/30/23 | 11/30/23 | Final announcements sent for 12/15 meeting. |
| 4A | Surface water quality monitoring data files | 12/1/23 | 12/1/23 | Submitted data collected from May-August 2023. |
| 1A | Progress report | 12/15/23 | 12/15/23 | Emailed spreadsheet as an attachment. |
| 3A | Monitoring activities report | 12/15/23 | 12/15/23 | Submitted as attachment to progress report. |
| 4D | Data submittal progress report | 12/15/23 | 12/15/23 | Submitted as attachment to progress report. |
| 6A | Document that webpage meets outlined requirements | 12/15/23 | 12/15/23 | Met all CRP guidance requirements outlined. |
| 6B | Maintain website and provide summary of updates or copies | in progress report | 12/15/23 | Attached summary of updates provided to TCEQ, to progress report. |
| 6H | Public participation and outreach activities | in progress report | 12/15/23 | No activity this quarter. |

Template for Activities Description

Instructions: Describe CRP activities conducted for each task in the current quarter. This information will be used to explain and justify expenses incurred each quarter. Example:

Table D-2. Description of Activities, FY 24 Quarter 1, Sept. 1, 2023 through Nov. 30, 2023

| Task | Description Of Activities |
|--|---|
| <p>1.0 Administration</p> | <p>Quarterly progress report submitted to TCEQ on 12/15/23.</p> <p>Letter agreement for Texas Stream Team training and coordination executed on 10/8/23. A copy is attached to this progress report.</p> |
| <p>2.0 Quality Assurance and Project Planning</p> | <p>FY 24-25 basin-wide QAPP and work plan has been posted on the website.</p> <p>Lab Update: Contracts with Dr. Shepherd have been executed for both labs. Work for first lab this quarter includes document reviews, audit planning, and on-site visits. Work for second lab this quarter includes internal audit follow-up and limit of detection (LOD) and limit of quantitation (LOQ) questions. Copies of the contracts are attached.</p> |
| <p>3.0 Water Quality Monitoring</p> | <p>All planned monitoring was completed for the quarter. See Monitoring Activities Report for details of monitoring activities for the quarter.</p> <p>Jane and John conducted river surveyor flow and morphology sampling from Sylvan Avenue to South Loop 12 in Dallas on 9/1/23 and in Irving on 9/2/23. Bill and Ted conducted flow and morphology sampling at Beltline in Grand Prairie on 9/9/23.</p> <p>Jane and John attended the TCEQ Data Management Training via video conference at the Fort Worth offices on 9/15-16/23.</p> <p>Jane and John attended the annual SWQM conference in Austin, Texas on 10/26-29/23.</p> |
| <p>4.0 Data Management</p> | <p>May-August 2023 data was reviewed and prepared for submission for the December data deliverable. See Data Submittal Progress Report.</p> |
| <p>5.0 Data Analysis and Reporting</p> | <p>Jane and John attended the Basin Summary Report preparation meeting on 10/26/23 in Austin.</p> <p>Data and trend analysis for this report has begun. At this time there are no plans to utilize outside services to complete the report.</p> |

| | |
|---|---|
| <p>6.0 Public Outreach and Participation</p> | <p>Website Updates:</p> <ul style="list-style-type: none"> • A review of the website was conducted using the requirements outlined in the CRP Guidance. All requirements are met. • Basin-wide QAPP posted to website on 10/31/23. • FY2024-2025 work plan posted to website on 12/15/23. • No other changes to website conducted this quarter. The river authority is in the process of upgrading the website software. <ul style="list-style-type: none"> ▪ More substantial changes may be made to the CRP website upon completion of the upgrade. ▪ The river authority has also begun to explore social media and networking sites. ▪ CRP staff has acquired sites and created pages for review by management. The pages are not viewable to the public now as they are pending approval by upper management. • Link to CRP coordinated monitoring schedule and TCEQ water quality data will be created on website after upgrades. <p>Outreach Activities:</p> <p>A new letter agreement with Texas Stream Team has been executed to continue services in FY 2024-2025. A copy of the letter is attached. Jane presented at an educational event in Anahuac on 9/11/23 and 9/12/23. Educational materials provided at the event by CRP are attached.</p> <p>Ellen conducted a K-5 teacher orientation to Major Rivers curriculum on 10/21/2023 for three schools in Kyle. Table of Contents are attached.</p> |
| <p>7.0 Special Studies</p> | <p>River authority CRP Data Management and Integration System: Work on this project is ongoing. Currently, work is being done to format the output from the lab's system into a format that is compatible with the new CRP data management and integration system. For example, mapping the fields to a compatible import format.</p> |



Template for the Monitoring Activities Report

Instructions: Provide a list of sampling activities planned and completed for each quarter with explanations for when sampling could not be completed. Planning agencies can submit this report with additional information if the information below is provided. Submitting and collecting entities and monitoring type code abbreviations are found in the Data Management Reference Guide (DMRG).



Table D-3. Monitoring Activities Report, Q2, Dec. 1, 2023-Feb. 28, 2024

| Segment | Long Description | Station ID | Submitting Entity | Collecting Entity | Monitoring Type | Comments | 24HR | Aquatic Habitat | Benthics | Nekton | Metals | Organics Water | Conventional | Bacteria | Inst. Flow | Field | First Quarter (Sept – Nov) Completed | Second Quarter (Dec – Feb) Completed | Third Quarter (Mar-May) Completed | Fourth Quarter (Jun-Aug) Completed |
|---------|---------------------------|------------|-------------------|-------------------|-----------------|----------|------|-----------------|----------|--------|--------|----------------|--------------|----------|------------|-------|---|---|--------------------------------------|---------------------------------------|
| 0604 | NECHES RIVER AT US 69 | 10585 | AN | AN | RT | | | | | | | | 4 | 4 | 4 | 4 | 10/17 | 2/5 | | |
| 0604A | CEDAR CREEK AT FM 2497 | 10478 | AN | AN | RT | | | | | | | | 4 | 4 | 4 | 4 | 9/27 | 1/3 | | |
| 0604A | CEDAR CREEK AT CR 1336 | 13528 | AN | AN | RT | | | | | | | | 4 | 4 | 4 | 4 | 9/27 | 1/3 | | |
| 0604B | HURRICANE CREEK AT SH 324 | 13529 | AN | AN | RT | | | | | | | | 4 | 4 | 4 | 4 | 9/27 | 1/3 | | |



| | | | | | | | | | | | | | | | | | | | | |
|--------------|------------------------------------|-------|----|----|----|--|--|--|--|--|--|--|---|---|---|---|-------|------|--|--|
| 0604B | HURRICANE CREEK AT LOOP 287 | 10487 | AN | AN | RT | | | | | | | | 4 | 4 | 4 | 4 | 9/27 | 1/3 | | |
| 0604B | HURRICANE CREEK BELOW KIWANIS PARK | 21433 | AN | AN | RT | | | | | | | | 4 | 4 | 4 | 4 | 9/27 | 1/3 | | |
| 0604C | JACK CREEK AT FM 2497 | 10492 | AN | AN | RT | | | | | | | | 4 | 4 | 4 | 4 | 9/27 | 1/3 | | |
| 0604C | JACK CREEK AT SH 94 | 10493 | AN | AN | RT | | | | | | | | 4 | 4 | 4 | 4 | 10/16 | 1/30 | | |
| 0604C | JACK CREEK AT FM 3150 | 10494 | AN | AN | RT | | | | | | | | 4 | 4 | 4 | 4 | 10/16 | 1/30 | | |
| 0604D | PINEY CREEK AT FM 358 | 16096 | AN | AN | RT | | | | | | | | 4 | 4 | 4 | 4 | 10/16 | 1/30 | | |



Exhibit 1E. Personnel Eligibility List and Fringe Benefits Methodology



Personnel Eligibility List

Instructions: The planning agency will provide a list of personnel who will be designated to work on, and are eligible to charge to, the contract. This form can be recreated using the planning agency's own software, but these fields are required at a minimum. Please add any special notes to ensure PEL information can be reconciled against payroll and personnel records (e.g., salaries estimated based on X, or salaries include projected pay increases). Cost estimates for fringe benefits may be added to this report in separate columns, if desired, and the benefits need to be identified.

If TCEQ will be reimbursing salary or wages, the planning agency must submit a completed PEL prior to starting activities under the contract and an updated PEL with any invoice following changes to the information provided in the most recent PEL. If a contract amendment is necessary due to changes reflected on the PEL, the planning agency must immediately submit an updated PEL with a request to amend the contract.

A PEL form will be provided in the contract.



Fringe Benefits Methodology

Instructions: This form provides a format that can be modified to show how fringe benefits are budgeted and invoiced. The planning agency may provide rate computations in their own format or by adding columns to the PEL, in lieu of this form. Please indicate whether fringe benefits are invoiced as specifically identified to each employee or using established rates updated annually.

Table E-1. Fringe Benefits Methodology

| Fringe Benefits (Based on Salaries Paid) | Cost Per Month | Annual Cost (A) | % Time to Contract (B) | Contract Annual Cost (A x B) |
|--|-------------------|--------------------|------------------------------|---------------------------------|
| Retirement Matching (Specify) | | | | |
| FICA Matching | | | | |
| Social Security % | | | | |
| Medicare % | | | | |
| Insurance | | | | |
| Medical | | | | |
| Dental | | | | |
| Vision | | | | |
| Life | | | | |
| Workers Compensation | | | | |
| Unemployment Benefits | | | | |
| FUTA | | | | |
| SUTA | | | | |
| Other Benefits (Specify) | | | | |
| Total Annual Cost (Fringe Benefits) | | | | \$ |



Exhibit 1F. Equipment Inventory Format

Instructions: Provide a list of equipment and trackable durable supplies purchased fully or partially with program funds and equipment loaned by TCEQ. If purchased partially with CRP funds, the proportion of ownership and use should be reflected in the equipment inventory. Example:

Table F-1. Equipment Inventory Format

| Contract No. | Item Descript. | Serial No. | Cost | Date of Purchase | Located In | Working Condition | Comments |
|--------------|-----------------------------------|------------|--------|------------------|--------------------------|--------------------|--|
| 582-0-8141_ | 600 MHz Computer with 19" Monitor | 3493322 | \$1450 | 05/01/00 | Main Office Rm 201 | Good | Use as CRP GIS computer and as river authority data storage unit |
| 582-2-8141_ | Hydrolab | 853-4762 | \$8000 | 07/02/00 | Upper Basin Field Office | Needs new membrane | For CRP use in lake monitoring |
| 582-4-8141_ | Automatic Sampler | 001399 | \$2500 | 08/21/00 | Main Office Storage Room | Missing messenger | For CRP use |
| 582-6-8141_ | Flow Meter | 388-SJ99 | \$6500 | 11/14/00 | Main Office Field Equip. | Good | For CRP use |
| 582-6-4442_ | GPS Unit | G7754-01 | \$5000 | 10/15/01 | Main Office Storage Room | Good | For CRP and river authority use |



Exhibit 1G. Procurement System Certification



Exhibit 1H. Workplan Shell

Task 1: Project Administration

Objective: To manage all administrative functions required to support the Clean Rivers Program (CRP) contract, including:

- Informative and timely progress reports.
- Participation in conference calls.
- Participation at CRP meetings.
- Timely and accurate reimbursement forms with adequate documentation.
- Efficient cost control to ensure expenses are allowable and applicable.
- Responsibility for procurement and oversight of subcontractors.
- Participation in fiscal monitoring reviews.
- Timely and accurate deliverables that meet the intent of the FY2024-2025 CRP Guidance.
- Adherence to TCEQ contract provisions.
- Detailed and reasonable work plan development.
- Financial reporting and budget monitoring.
- Training to ensure personnel are properly prepared to conduct work.

Task Description: *Provide a narrative description of the work that will be performed to accomplish this task. Where applicable, describe how individual deliverables will be completed and the level of effort needed to meet task objectives. Following is a suggested task description that can be modified to include the specific activities of the Performing Party in the work plan.*

The Performing Party will complete the following subtasks:

Progress Reports—Progress reports will contain a level of detail sufficient to document the activities which occurred during the appropriate quarter and provide detailed supporting documentation and justification for reimbursement requests. Progress reports will contain a general description of activities, a detailed tracking of deliverables, and the water quality monitoring activities which occurred during the quarter. The Progress report will be in the format provided in Exhibit 1D of the FY2024-2025 CRP Guidance.

Reimbursement Requests—A Financial Status Report, Supplemental Forms, and a current Personnel Eligibility List (PEL) will be submitted along with appropriate additional documentation (e.g., subcontractor invoices) on a quarterly basis. An updated Equipment Inventory List will be submitted with the Reimbursement request when changes occur during the quarter. Budget Revision Requests will be made in advance of making changes to the budget.

Contractor and Subcontractor Evaluations—An annual self-evaluation and evaluations of subcontractors will be submitted at the end of each fiscal year.

Procurement Procedures Documentation—Documentation of the procurement process used to solicit, evaluate, pay, and oversee subcontractors, as specified in the FY2024-2025 CRP Guidance, will be developed. This documentation will be maintained in-house and will be made available for review by TCEQ staff upon request. For each subcontract made in association with this contract, the Performing Party will provide a memo describing the procurement method used and a summary of the work to be performed to the TCEQ CRP project manager. In addition, a Procurement System Certification will be submitted with the supporting documentation required with the FY2024-2025 work plan, in accordance with the FY2024-2025 CRP Guidance.

Conference Calls—The Performing Party will participate in all scheduled conference calls unless other arrangements are made with the TCEQ CRP project manager.

Conferences and Training Events or Other Events—The Performing Party will participate in meetings and training events as scheduled by TCEQ for the Texas CRP. All non-CRP conferences and training events need to be pre-approved by TCEQ prior to incurring costs associated with such events. *List all and any non-CRP training events or conferences that are planned.*

Documentation for Desk Review or On-Site Visit—Detailed supporting documentation, in addition to the quarterly reimbursement documentation, will be made available upon request. The additional supporting documentation will include those items outlined in Exhibit 1B of the FY2024- 2025 CRP Guidance. In the case of an on-site visit, the appropriate Performing Party personnel will be available during the visit.

FY2026-2027 Work Plan and Supporting Documentation—The work plan and supporting documentation will be prepared and submitted as specified in the FY2026-2027 CRP Guidance. Supporting documentation will include (as applicable): budget by category, budget by task, PEL, fringe rate methodology, indirect rate methodology, allocated costs documentation, equipment purchase request list, equipment inventory, a list of subcontracted tasks, a list of known training events and conferences, and a signed Procurement System Certification. The work plan will include the tasks and deliverables outlined in the FY2026-2027 Guidance and will be negotiated with TCEQ. A proposed work plan will be submitted to TCEQ for review, and comments will be provided. The Performing Party will address all TCEQ comments and submit a final work plan.



Deliverables and Due Dates:

September 1, 2023 through August 31, 2024

- A. Progress Reports—December 15, 2023; March 15 and June 15, 2024
- B. Annual Self-Evaluation and, if applicable, Subcontractor Evaluations—August 31, 2024
- C. Procurement Procedures Documentation Memo—within 30 days after the subcontract is executed
- D. Additional Supporting Documentation for Desk Review or Site Visit—upon request

September 1, 2024 through August 31, 2025

- A. Progress Reports—September 15 and December 15, 2024; March 15, June 15, and August 15, 2025
- B. Proposed FY2026 - 2027 Work Plan and Supporting Documentation—December 15, 2024
- C. Final FY2026 - 2027 Work Plan and Supporting Documentation—February 1, 2025
- D. Annual Self Evaluation and, if applicable, Subcontractor Evaluations—August 31, 2025
- E. Procurement Procedures Documentation Memo—within 30 days after the subcontract is executed
- F. Additional Supporting Documentation for Desk Review or Site Visit—upon request

Task 2: Quality Assurance

Objective: To conduct data collection activities in accordance with an integrated system of quality management activities involving planning, assessment, implementation, training, and quality improvement. This task addresses objectives and processes for:

- Quality Assurance Project Plan (QAPP) development and implementation.
- Laboratory quality assurance.
- Data review, verification, and validation.
- Oversight of project(s).
- Special studies project planning.

Task Description: *Provide a narrative description of the work that will be performed to accomplish this task. Where applicable, describe how individual deliverables will be completed and the level of effort needed to meet task objectives. Following is a suggested task description that can be modified to include the specific activities of the Performing Party.*

All work funded by this contract that involves the acquisition of environmental data generated from direct measurement activities, collected from other sources, or compiled from computerized databases and information systems will be planned in consultation with TCEQ and documented in a fully approved TCEQ QAPP before data collection can be implemented.

The planning agency will complete the following subtasks described below:

NELAP Accreditation—*Costs associated with the National Environmental Laboratory Accreditation Program (NELAP) as they relate to the CRP (e.g., Proficiency Test samples, NELAP consultants, accreditation) may be charged directly or indirectly to the program but must be fully explained and justified in the work plan and include deliverables.*

Laboratory data will be produced by laboratories (and subcontract laboratories) whose quality assurance program is consistent with the NELAC Institute (TNI) standards.

Basin-wide QAPP—The basin-wide QAPP will be submitted to TCEQ in the TCEQ-approved shell format. Only those sites covered by the QAPP and parameters satisfying the requirements of Texas Water Code (TWC) Chapter 5, Subchapter R (TWC Section 5.801 et seq) and Title 30, Texas Administrative Code (30 TAC) Chapter 25, Subchapters A and B will be included in the document. The Performing Party will address all TCEQ comments and submit the revised QAPP to TCEQ within 30 days after receiving comments from TCEQ.

The Performing Party will secure written documentation (signature in the QAPP or Adherence Letter) from participants under the QAPP stating their awareness of and

commitment to adhere to the requirements contained in the QAPP and any appendices and amendments. This documentation will be maintained as part of the Performing Party's quality assurance records. Copies of all Adherence Letters must be forwarded to TCEQ no later than 45 days following TCEQ's approval of the QAPP, but prior to the monitoring event. (Note: Adherence Letters are not required for entities who sign the QAPP). The Performing Party will distribute the QAPP to all participants (including the laboratory).

Documentation of distribution and acknowledgement of receipt will be maintained by the Performing Party and be available for review during a TCEQ monitoring systems audit.

Sections of the basin-wide QAPP will be posted to the Performing Party's CRP webpage. These sections include the monitoring program or project objectives, measurement performance specifications (i.e., Table A7 of the QAPP), appendices, and the monitoring schedule and maps of sampling sites.

QAPP Amendment to Appendix B—The monitoring schedule in Appendix B of the basin-wide QAPP will be updated for the second year of the contract biennium after the annual coordinated monitoring meeting. This special type of QAPP amendment will be submitted using the TCEQ-approved shell format. Only the sites covered by the Performing Party's QAPP will be included in Appendix B of the QAPP.

Planning for Special Studies or Permit Support Monitoring—In consultation with TCEQ staff, and in consideration of the elements of the QAPP, special studies and monitoring projects to support permits will be systematically planned. The Performing Party project manager will coordinate with TCEQ to establish the planning team, schedule the meeting (90 days prior to the planned sampling date), distribute meeting materials in advance of the meeting, facilitate the meeting, and prepare meeting minutes. The Performing Party will submit planning materials for the meeting to all participants no later than one week prior to the meeting. Meeting materials will include, as appropriate, a problem definition, as currently understood, a description of the budget, personnel and schedule issues, maps, information on past or on-going studies, historical water quality data, Integrated Report findings, wastewater discharge information, known or expected sources of contamination, existing monitoring sites, land use information, etc. Planning meeting summary notes will be provided to participants within two weeks of the meeting. The information developed during the planning meeting will be incorporated into a QAPP appendix.

QAPP Appendices—Special studies and permit support monitoring projects that have different objectives than those described in the basin-wide QAPP will be incorporated into the QAPP as appendices after they are thoroughly planned in consultation with TCEQ. The QAPP appendices will be written in the TCEQ prescribed format and reference sections of the basin-wide QAPP as appropriate, and otherwise address

information unique to the project. Unique aspects of special projects include the problem definition, the task description, measurement performance specifications, sample design rationale, sampling methods requirements, etc. QAPP appendices will be sent to TCEQ through the TCEQ CRP project manager. QAPP appendices for Special Studies or Permit Support Monitoring will be submitted to TCEQ no later than 30 days after the planning meeting using the TCEQ-approved shell format. The Performing Party will address TCEQ comments, modify the document, and submit the final QAPP appendix to the project manager within 30 days of receipt of TCEQ comments.

QAPP Amendments and Revisions to Appendices—Changes in parameters, sampling or analytical procedures, project organization, and other items of an existing project necessitates an amendment to the QAPP or Revisions to Appendices. Amendments and Revisions to Appendices will be submitted electronically to the TCEQ CRP project manager on an "as needed" basis in the TCEQ-approved shell format for agency review. Upon approval, QAPP Amendments and Revisions to Appendices will be distributed to all personnel on the distribution list maintained by the Performing Party. Documentation of distribution and acknowledgement of receipt will be maintained by the Performing Party and be available for review during a TCEQ monitoring systems audit.

Project Oversight—The Performing Party will participate in monitoring systems audits and laboratory inspections by TCEQ.

The Performing Party will conduct oversight of subparticipants (including contractors and in-kind participants) who conduct field monitoring under their basin-wide QAPP. The assessment will be performed once during the contract cycle in the case of on-going projects, or once during a project's lifetime in the case of short-lived special studies. *(Two basic types of on-site assessment are acceptable: readiness reviews and monitoring systems audits. The Performing Party should elaborate as to the type of assessment that will be performed on every program or project in the QAPP. Note: The on-site assessment requirement does not apply if all work is performed by the Performing Party.)*

Following the on-site assessment, the Performing Party will provide the audited organization with an audit report within 30 days. If no findings are made, the report will make this clear. Findings made during the audit will be documented in the audit report. Audit reports will contain references to written specifications, as defined in the QAPP or in a standard operating procedure (SOP). The audited organization will be asked to respond in writing to the report within 30 days. A copy of the audit report and the response will be submitted as a deliverable to the TCEQ CRP project manager with the progress report no later than the quarter following the one in which the audit was conducted.



Corrective Action Reports—Issues that may affect data quality and availability will be tracked, addressed, and reported to TCEQ using the definitions and corrective action strategy laid out in the FY2024-2025 CRP Guidance. The Performing Party must address deviations associated with sampling activities, chain-of-custody, analytical method requirements, quality control, and data management.

Deliverables and Due Dates:

September 1, 2023 through August 31, 2024

- A. Basin-wide QAPP receipt acknowledgement and adherence letters (if applicable)—October 15, 2023
- B. Specified sections of the basin-wide QAPP posted to the webpage—October 31, 2023
- C. Draft QAPP Appendix B Amendment for FY2025 monitoring—June 1, 2024
- D. Final QAPP Appendix B Amendment for FY2025 monitoring—August 1, 2024
- E. Planning meetings for special studies or permit support monitoring (if applicable)—90 days prior to the planned sampling date
- F. Planning meeting summary notes for Special Studies or Permit Support Monitoring (if applicable)—no later than two weeks after the planning meeting
- G. Draft QAPP Appendices for Special Studies or Permit Support Monitoring (if applicable)—no later than 30 days after the planning meeting
- H. Final QAPP Appendices for Special Studies or Permit Support Monitoring (if applicable)—no later than 30 days after the receipt of TCEQ comments
- I. QAPP Amendments and Revisions to Appendices (if applicable)—as needed
- J. QAPP Appendix and Amendment Receipt Acknowledgement and Adherence Letters (if applicable)—no later than 45 days after TCEQ approval of the QAPP, but prior to the monitoring event
- K. Participate in TCEQ monitoring systems audit(s) and response to comments (if applicable)—date planned in consultation with TCEQ
- L. Conduct on-site oversight assessment of subparticipants, once during each project or once during contract cycle (if applicable)—to be scheduled
- M. On-site project oversight report and response (if applicable)—with the progress report no later than the quarter following the one in which the audit was conducted
- N. Corrective action status report (if applicable)—with progress report



September 1, 2024 through August 31, 2025

- A. Draft FY2026-2027 basin-wide QAPP—June 1, 2025
- B. Final FY2026-2027 QAPP—August 1, 2025
- C. Planning meetings for Special Studies or Permit Support Monitoring (if applicable)—90 days prior to the planned sampling date
- D. Planning meeting summary notes for Special Studies or Permit Support Monitoring (if applicable)—no later than two weeks after the planning meeting
- E. Draft QAPP Appendices for Special Studies or Permit Support Monitoring (if applicable)—no later than 30 days after the planning meeting
- F. Final QAPP Appendices for Special Studies or Permit Support Monitoring (if applicable)—no later than 30 days after the receipt of TCEQ comments
- G. QAPP Amendments and Revisions to Appendices (if applicable)—as needed
- H. QAPP Appendix and Amendment Receipt Acknowledgement and Adherence Letters (if applicable)—no later than 45 days after TCEQ approval of the QAPP, but prior to the monitoring event
- I. Participate in TCEQ monitoring systems audit(s) and response to comments (if applicable)—date planned in consultation with TCEQ
- J. Conduct on-site oversight assessment of subparticipants, once during each project or once during contract cycle (if applicable)—August 1, 2025
- K. On-site project oversight report and response (if applicable)—with the progress report no later than the quarter following the one in which the audit was conducted; if audit was conducted in the last quarter, submit August 15, 2025
- L. Corrective action status report (if applicable)—with progress report

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:

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

Task Description: *Provide a narrative description of the work that will be performed to accomplish this task. Where applicable, describe how individual deliverables will be completed and the level of effort needed to meet task objectives. Following is a suggested task description that can be modified to include the specific activities of the Performing Party.*

The Performing Party will complete the following subtasks:

Monitoring Description—*List the minimum number of sites that will be sampled each year. Indicate the sampling frequency and the types of parameter groups that will be collected (e.g., In FY2024, 45 sites monthly for field, flow, conventional parameters, and bacteria; 12 sites annually for metals; 6 sites for biological and habitat twice per year during the index period of March 15 and October 15, with one event falling between July 1 and September 30. In FY2025, the Performing Party will monitor at a similar level of effort as in FY2024. The actual number of sites, location, frequency, and parameters collected for FY2025 will be based on priorities identified at the Basin Steering Committee and Coordinated Monitoring meetings and included in the amended Appendix B schedule of the QAPP.)*

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

Coordinated Monitoring Meeting—The Performing Party will hold an annual coordinated monitoring meeting as described in the 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 (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

Task 4: Data Management

Objectives: To manage a quality-assured water quality monitoring database and submit data to TCEQ in the required format for inclusion in the Surface Water Quality Monitoring Information System (SWQMIS) database.

Task Description: Surface water quality monitoring data files, including biological, special studies, and targeted monitoring data, as applicable, will be transferred to TCEQ in the correct format using the TCEQ file structure. Binary large object (BLOB) files will be provided with biological data as outlined in the FY 2024-2025 CRP Guidance. Data collected under this contract which are not able to be submitted to TCEQ prior to the end of the contract term will be submitted within the contract established for FY 2026-2027. Data that was collected under the previous contract established for FY2022-2023 which were not able to be submitted to TCEQ prior to the end of the contract term will be submitted in within the contract established for FY2024-2025.

The Performing Party will complete the following subtasks:

The Performing Party will review each data set using the data review checklist and the SWQMIS Data Loader. A Data Summary (including information on data completeness), data review checklist, and the SWQMIS Validator Report will be submitted with each data set. The Data Summary will contain basic identifying information about the data set, information regarding inconsistencies and errors identified during data verification and validation steps, or problems with data collection efforts.

The Performing Party will submit surface water quality monitoring data and BLOB files to TCEQ as specified in the Deliverables and Due Dates subsection of this task. The Performing Party will complete and submit a data submittal progress report as an attachment to the progress report. The data submittal progress report will document the extent to which data collected has been submitted to TCEQ. The report should summarize the status of data submittals for all data providers described in the Performing Party's basin-wide QAPP. The report will track and document that all data and BLOB file submittals are completed and submitted to TCEQ. The report will also track and document that data intended for inclusion in the Texas Integrated Report of Surface Water Quality (IR) is submitted to TCEQ. For data to be considered in the IR, the Performing Party and subcontractor data (if applicable) must be submitted to TCEQ as specified in the Deliverables and Due Dates subsection of this task. TCEQ's call for data for inclusion in the IR is February 1 (early submission date) and March 1 (final submission date) of odd numbered years. The progress report can be utilized to provide any additional information regarding data submittals not captured in the data submittal progress report.



Station location requests will be submitted via SWQMIS, and data correction requests will be submitted to the TCEQ project manager within an agreed upon timeframe.

Water quality data approved by TCEQ will be posted on the Performing Party's webpage at least two times per year, or a link may be provided to the [TCEQ Surface Water Quality Web Reporting Tool](#).⁷

Deliverables and Due Dates:

September 1, 2023 through August 31, 2024

- A. Surface water quality monitoring data files, SWQMIS Validator Report, Data Review Checklist, and Data Summary—December 1, 2023; March 1 and August 1, 2024
- B. Surface water quality monitoring data updates to webpage or link to TCEQ's water quality data—February 1 and August 1, 2024
- C. BLOB files—submit within timeframe(s) agreed upon with TCEQ project manager
- D. Data submittal progress report, submitted with progress reports—December 15, 2023; March 15 and June 15, 2024
- E. Station location requests submitted to SWQMIS—as needed each quarter
- F. Data correction requests, as needed—within timeframe(s) agreed upon with TCEQ project manager

September 1, 2024 through August 31, 2025

- A. Surface water quality monitoring data files SWQMIS Validator Report, Data Review Checklist, and Data Summary—December 1, 2024; February 1, March 1, and August 1, 2025
- B. Surface water quality monitoring data updates posted to webpage, or link to TCEQ's water quality data—February 1 and August 1, 2025
- C. BLOB files—submit within timeframe(s) agreed upon with TCEQ project manager
- D. Data submittal progress report, submitted with progress reports—September 15 and December 15, 2024; March 15 and June 15 and August 15, 2025
- E. Station location requests submitted to SWQMIS—as needed each quarter
- F. Data correction requests, as needed—within timeframe(s) agreed upon with TCEQ project manager

7. www80.tceq.texas.gov/SwqmisPublic/index.htm

Task 5: Data Analysis and Reporting

Objectives: Conduct data analysis and develop reports that provide information to describe water quality and identify priority water quality issues for further investigation or action.

This work will:

- Correlate watershed characteristics with water quality conditions.
- Highlight areas where water quality appears to be improving or declining.
- Support or validate the Texas Integrated Report of Surface Water Quality findings.
- Support planning of monitoring efforts.
- Identify areas where nonpoint source management efforts may be applied.
- Provide information for stakeholders to discuss at Steering Committee meetings.

Task Description: *Provide a narrative description of the work that will be performed to accomplish this task. Include how the water quality and biological data collected under the previous Performing Party-TCEQ contract and submitted under this new contract will be used in the data analysis and reporting. Where applicable, describe how individual deliverables will be completed and the level of effort needed to meet task objectives. Following is a suggested task description that can be modified to include the specific activities of the Performing Party for inclusion in the work plan.*

The planning agency will complete the following subtasks described below:

Basin Highlights Report—The Performing Party may vary the content of the Basin Highlights Report to reduce repetition of information that does not change on an annual basis. The Basin Highlights Report will follow one of the versions described below as detailed in the FY2024-2025 CRP Guidance.

The Standard Report

- Overview of water quality monitoring; describe each organization's participation.
- Top water quality issues in the basin for stakeholder prioritization and monitoring decisions.
- Description of water quality conditions for each segment and water body.
- Summary of findings from special studies.
- Maps showing the location of sampling sites and water quality issues.
- Summary of Steering Committee and other public outreach activities.
- Instructions on how to get involved in Steering Committee meetings, volunteer monitoring, and other opportunities for participation.
- Information on the CRP content featured on the Performing Party's webpage.

Watershed Characterization

- Descriptions of segments with the areas of impairment or interest described.
- Stream or reservoir hydrology.
- Impairment and area of interest description.
- Land use and natural characteristics.
- Potential causes of each impairment.
- Potential stakeholders.
- Recommendations for improving water quality.
- Maps including water bodies and relevant spatial conditions.
- Ongoing projects.
- Images of water bodies and watershed areas being characterized.
- Major watershed events (present and future).

Program Update

- An update on major basin activities, changes, and events.
- An update of basin water quality monitoring activities.
- An update on the top water quality concerns and issues in the basin.
- A summary of findings from special studies.
- Maps showing the location of sampling sites and major water quality issues.
- An update on public outreach and educational activities.
- Links to additional resources.

Electronic copies of the draft report and one electronic copy of the final report will be provided to TCEQ. TCEQ will provide comments on the draft report and the Performing Party will address TCEQ comments. Final approval of the report will rest with TCEQ. The reports will be made available to Steering Committee members and all basin stakeholders and will be posted on the Performing Party's webpage.

Basin Summary Report—The Basin Summary Report will follow the outline described in the FY2024-2025 CRP Guidance. The report will include a comprehensive review of water quality for the entire basin, including:

- A description of the water quality conditions and issues.
- Trend analysis of water quality by station and parameter.
- Maps showing watershed characteristics, sampling stations, and water quality issues.

- A discussion of the watershed characteristics and their potential influence on water quality.
- Recommendations for water quality management strategies to correct identified water quality problems and pollution sources.

A meeting between the Performing Party and TCEQ CRP staff will be arranged prior to the commencement of substantial work on the report. The Performing Party will be prepared to discuss site selection for trend analysis, report content and layout, methodology for data review, and address other questions or suggestions for the report.

A pre-draft or watershed summary will be provided to the TCEQ CRP project manager and must be approved prior to completing the first draft. The Basin Summary Report will be presented to the Steering Committee for review and comment. Resolution of comments will be coordinated with the public and TCEQ, if necessary. The Performing Party will provide an electronic copy of the draft report to TCEQ and TCEQ will provide comments and the Performing Party will address the comments; final approval of the report will rest with TCEQ. One electronic copy of the final report will be provided to TCEQ. The reports will be made available to Steering Committee members and all basin stakeholders and will be posted on the Performing Party's webpage. The planning agency will submit a final Basin Summary Report to the Texas Parks and Wildlife Department, Texas State Soil and Water Conservation Board, the governor, the lieutenant governor, and the speaker of the House of Representatives not later than the 90th day after the date the report is submitted to TCEQ.

Deliverables and Due Dates:

September 1, 2023 through August 31, 2024

- A. Preparation meeting for Basin Summary Report—by November 15, 2023
- B. Pre-Draft Watershed Summary—December 15, 2023
- C. Draft Basin Highlights Report—February 15, 2024
- D. Draft Basin Summary Report—March 15, 2024
- E. Final Basin Highlights Report—May 15, 2024
- F. Final Basin Summary Report—May 31, 2024
 1. Post Report to web page—June 30, 2024
 2. Record of final Basin Summary Report submittals—August 31, 2024



September 1, 2024 through August 31, 2025

- A. Preparation meeting for Basin Summary Report—by November 15, 2024
- B. Pre-Draft Watershed Summary—December 15, 2024
- C. Draft Basin Highlights Report—February 15, 2025
- D. Draft Basin Summary Report—March 15, 2025
- E. Final Basin Highlights Report—May 15, 2025
- F. Final Basin Summary Report—May 31, 2025
- G. Post Report to webpage—June 30, 2025
- H. Record of final Basin Summary Report submittals—August 31, 2025

Task 6: Stakeholder Participation and Public Outreach

Objectives: Enhance and support participation of stakeholders in the development of water quality objectives and priorities for the basin, and CRP as a whole. Engage in education and outreach activities to enhance stakeholder knowledge and involvement.

The Steering Committee serves as the focus of public input and assists with:

- Creation of specific, achievable water quality objectives and basin priorities.
- Review and development of work plans and allocation of resources.
- Review, development, and approval of major reports.
- Establishment of monitoring priorities and development of monitoring plans.
- Identification of priority problem areas and possible actions to address these problems and pollutant sources.

Stakeholders should be engaged through outreach and education activities that support the CRP goals. This can be accomplished by:

- Providing several forums for citizens to contribute their ideas and concerns.
- Participating in outreach and education activities to increase public awareness about water quality issues in the basin.
- Communicating information on water quality issues so that priorities may be set considering local, regional, state, and federal needs.
- Providing opportunities for volunteer citizen monitoring of basin water bodies.

Task Description: *Provide a narrative description of the work that will be performed to accomplish this task. Where applicable, describe how individual deliverables will be completed and the level of effort needed to meet task objectives. Following is a suggested task description that can be modified to include the specific activities of the Performing Party for inclusion in the work plan.*

The planning agency will complete the following subtasks described below:

Steering Committee and Meetings—To sufficiently address the different interests, concerns and priorities of each watershed, the Performing Party will work to ensure that its Steering Committee includes stakeholder volunteers from across the basin that represent the groups identified in the FY2024-2025 CRP Guidance. If specified groups are not represented, efforts will be made to recruit representatives before the next scheduled meeting. To engage new members and increase participation, the Performing Party will take every opportunity to promote the CRP and involvement in the Steering Committee.

To meet the goals and coordination requirements of the FY2024-2025 CRP Guidance, the Performing Party will conduct a minimum of *(number)* Steering Committee meetings during the month(s) of *(months)*. Additional sub-committees or other public meetings may also be convened to help complete the requirements. All requirements related to meetings will be followed and required public meetings will be conducted in-person or via TCEQ-approved virtual formats.

The Performing Party will contact stakeholders at least 45 days in advance of meeting date(s) to encourage participation. A questionnaire, which will be sent to all interested stakeholders, will provide a list of proposed agenda topics, request confirmation of continued interest and participation in the Steering Committee, and request input on additional topics and potential stakeholders. Along with the priority agenda topics identified in the CRP Guidance, Steering Committee meetings will include additional topics of significant interest to stakeholders. A final meeting announcement and agenda will be made available at least 15 days prior to the meeting.

After each Steering Committee meeting, the Performing Party will ensure all stakeholder input, comments, decisions, and any other meeting decisions are addressed, where applicable. For all Steering Committee meetings, copies of meeting materials will be provided with the next progress report, and include: a copy of the meeting agenda, presentations, meeting minutes, and a list of attendees. Steering Committee meeting minutes will also be posted to the Performing Party's website and the posting of the meeting minutes will be documented in the progress report following the meeting.

Education and Outreach—The Performing Party will conduct a minimum of XX public participation, outreach, or volunteer monitoring activities. For any public participation, outreach, or volunteer monitoring activities, a copy of the summary of activities, materials produced or distributed by the Performing Party, and a list of participants will be included in the subsequent progress report.

The Performing Party will develop, maintain, update, and report on their webpage as specified in the FY2024-2025 CRP Guidance. The webpage will be reviewed on a quarterly basis to ensure that information and announcements remain current and relevant. The Performing Party will also include summaries of revisions to the webpage in the corresponding quarterly progress report.



Deliverables and Due Dates:

September 1, 2023 through August 31, 2024

- A. Document that webpage meets outlined requirements—December 15, 2023
- B. Summarize webpage updates and submit with quarterly progress report—December 15, 2023; March 15 and June 15, 2024
- C. Contact Steering Committee members with questionnaire, draft agenda topics and confirm participation—a minimum of 45 days prior to Steering Committee meeting date
- D. Final announcements and agenda for Steering Committee meetings—a minimum of 15 days in advance of meeting
- E. Steering Committee meeting—number of meetings held, and dates as negotiated with TCEQ project manager
- F. Steering Committee meeting materials—with progress report following meeting
- G. Steering Committee meeting minutes posted to the webpage—indicate in progress report following meeting
- H. Materials from education and outreach activities and number of events included with quarterly progress report—December 15, 2023; March 15 and June 15, 2024

September 1, 2024 through August 31, 2025

- A. Summarize webpage updates and submit with quarterly progress report—September 15 and December 15, 2024; March 15, June 15, and August 15, 2025
- B. Contact Steering Committee members with questionnaire, draft agenda topics and confirm participation—a *minimum of 45 days prior to Steering Committee meeting date*
- C. Final announcements and agenda for Steering Committee meetings—a *minimum of 15 days in advance of meeting*
- D. Steering Committee meeting—number of meetings held, and dates as negotiated with CRP Project Manager
- E. Steering Committee meeting materials—with *progress report following meeting*
- F. Steering Committee meeting minutes posted to the webpage—*indicate in progress report following meeting*
- G. Materials from education and outreach activities and number of events included with quarterly progress report—September 15 and December 15, 2024; March 15, June 15, and August 15, 2025

Task 7: Special Projects

Objectives: *Special projects may be developed to address watershed-specific concerns that may influence water quality as identified by the Performing Party and Steering Committee as priority issues for the basin. If more than one project is planned, each one should be defined as a subtask (Task 7.1, Task 7.2, etc.) with separate plans, deliverables, and budgets. The Performing Party should work closely with their TCEQ CRP project manager since most of these projects will require meetings to discuss and scope out project plans.*

Objectives for this task will depend on the project to be addressed. Any projects with water quality monitoring activities defined in a QAPP will be addressed as a Special Project in Task 3.

Task Description: *Provide a narrative description of the work that will be performed to accomplish this task. Where applicable, describe how individual deliverables will be completed and the level of effort needed to meet task objectives.*

The planning agency will complete the following subtasks described below:

Deliverables and Due Dates:

September 1, 2023 through August 31, 2024

- Add Project-specific deliverables

September 1, 2024 through August 31, 2025

- Add Project-specific deliverables



Task 2: Quality Assurance

In This Task

- About Task 2 75
- Contract Provisions 75
- Approval to Conduct Work..... 76
- QAPP Extensions 76
- Quality Assurance Project Plans 77
- Biennial Submittal of Basin-wide QAPPs 77
- Data Collection Procedures 77
- QAPP Maps 77
- Draft QAPPs 78
 - Basin-wide QAPPs 78
 - Approval, Signature, and Distribution of Basin-Wide QAPPs..... 78
- QAPP Amendments 79
- Annual QAPP Updates, Including Appendix B: Monitoring Schedule Update 81
- Project Oversight 81
- Planning Agency Oversight Requirements..... 81
 - Status Monitoring 81
 - Laboratory Oversight 82
- Subparticipant Oversight Requirements 82
 - Readiness Review 83
 - Monitoring Systems Audit 83
 - Data Traceability Exercises 83
 - Report and Response..... 84
- Corrective Action Process for Deficiencies..... 84
- Data Review, Verification, and Validation..... 86
- TCEQ Oversight Requirements 89
 - TCEQ Laboratory and Monitoring Systems Audits 89
 - Specific CRP Laboratory Requirements 90
 - Ambient Water Reporting Limits (AWRLs)..... 90
 - Authorized Laboratory Methods 91
 - Statistical Control of Precision and Bias..... 91
 - Laboratory Test Reports..... 91
 - Laboratory Data Review..... 92



| | |
|---|-----|
| Website Deliverable..... | 92 |
| Quality Assurance Training..... | 92 |
| Special Project Planning..... | 93 |
| QAPP Appendices | 94 |
| Special Study or Permit Support Monitoring | 94 |
| Use of Acquired Data..... | 94 |
| Exhibit 2A. Corrective Action Process Flow Chart..... | 96 |
| Exhibit 2B. Corrective Action Status Table..... | 98 |
| Exhibit 2C. Corrective Action Plan Form..... | 100 |
| Exhibit 2D. Clean Rivers Program Audit Checklist..... | 103 |
| Exhibit 2E. Audit Response Template..... | 120 |

For QAPP Shell and related documents, see the [Clean Rivers Program: Quality Assurance](#)⁸ webpage.

8. www.tceq.texas.gov/waterquality/clean-rivers/qa/index.html

About Task 2

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

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

- Project objectives
- Measurement performance specifications
- Appropriate methods
- Field and laboratory quality control
- Data management
- Verification and validation of data
- Oversight
- Corrective action

The CRP uses QAPPs to plan, organize, and define quality assurance processes so data is collected with the level of reliability needed for decision-making. QAPPs for the CRP do not require Environmental Protection Agency (EPA) approval. TCEQ requires CRP data collection to be comparable to other data collected by TCEQ, and to be consistent with EPA requirements.

CRP QAPPs do not apply to and should not be used for data collection for federally funded programs or projects.

Contract Provisions

QA components are essential to the collection of valid data and to ensure data usability. Certain critical components related to quality assurance are essential to ensure that data produced by the CRP will be of the type and quality necessary for its intended use. These critical components represent the three key aspects of quality assurance: planning, implementation, and oversight. CRP contracts will incorporate the following provisions:

All work performed under this Contract must be complete and satisfactory in the reasonable judgment of TCEQ. All materials and equipment shall be handled in accordance with instructions of the applicable supplier, except as otherwise provided in the Contract.

All work performed under the contract that involves the acquisition of environmental data will be performed in accordance with a TCEQ-approved QAPP meeting all applicable TCEQ and EPA requirements. Environmental data includes any measurements or information that describe environmental processes, location, conditions, ecological or health effects and consequences. Environmental data includes information collected directly from measurements, produced from models, and compiled from other sources such as databases or literature. No data collection or other work covered by this requirement will be implemented prior to Performing Party's receipt of the QAPP signed by TCEQ and, if necessary, EPA. Without prejudice to any other remedies available to TCEQ, TCEQ may refuse reimbursement for any environmental data acquisition performed prior to approval of a QAPP by TCEQ and, if necessary, EPA. Also, without prejudice to any other remedies available to TCEQ, Performing Party's failure to meet the terms of the QAPP may result in TCEQ's suspension of associated activities and non-reimbursement of expenses related to the associated activities.

Any laboratory data or analyses provided under the contract must be prepared by a laboratory that is accredited by TCEQ according to Title 30, Texas Administrative Code, Chapter 25, subchapters A and B, unless TCEQ agrees in writing.

The Performing Party will conduct oversight of subparticipants (including contractors and in-kind participants) who conduct field monitoring under their basin-wide QAPP. The assessment will be performed once during the contract cycle in the case of on-going projects, or once during a project's lifetime in the case of short-lived special studies.

Approval to Conduct Work

Implement all work funded by the contract in accordance with an approved QAPP, including acquisition of environmental data generated from direct measurement activities, data collected from other sources, data compiled from computerized data bases and information systems, or the analysis and manipulation of any of this data. Limited exceptions may be granted under the conditions described below.

QAPP Extensions

Time constraints may cause lapses in basin-wide QAPP coverage at the beginning of a new two-year contract cycle. If no significant changes are planned in the next QAPP, and the new monitoring schedule is approved, the planning agency may request a temporary authorization to conditionally proceed with the monitoring plan under the existing QAPP.

The planning agency project manager must submit an e-mail request for conditional approval to the TCEQ CRP project manager before the existing QAPP expires. The project manager, with the concurrence of the TCEQ CRP program manager and the TCEQ lead quality assurance specialist may grant approval for a maximum of 90 days beyond the expiration date of the existing QAPP.

Quality Assurance Project Plans

The development and implementation of a QAPP helps to ensure:

- The projects use a planned approach.
- The objectives, roles, and responsibilities of participants are defined.
- The measurement systems are defined and appropriate.
- The project receives adequate oversight.
- The data verification and validation procedures are specified, thus enabling reconciliation with data quality objectives.

Biennial Submittal of Basin-wide QAPPs

Shells for all CRP QAPP documents can be accessed electronically at the Clean Rivers Program: Quality Assurance webpage. The use of shell documents streamlines QAPP preparation, review, and approval.

Much of the shell language represents CRP or TCEQ requirements. In the shells, language in standard text format is provided as an example of how to describe CRP activities. If activities in practice differ from the shell language, discuss these differences with the TCEQ CRP project manager and edit the QAPP draft(s) as necessary. Information to be provided by the planning agency is highlighted. Italicized instructions and instructions in the comment review layer are provided for the various sections and should be followed and deleted from the document before the QAPP draft is submitted to TCEQ.

Data Collection Procedures

The TCEQ *Surface Water Quality Monitoring Procedures* ([Volume I, RG-415](#)⁹ and [Volume II, RG-416](#)¹⁰) describes field procedures used for surface water sampling and biological collection for the purpose of submitting data to TCEQ. The QAPP states that the most recent version of the *Surface Water Quality Monitoring Procedures* must be used, including any updates made between revisions. If other SOPs apply, they should be referenced in the QAPP, as appropriate. Do not submit SOPs with the QAPP for TCEQ review unless specifically requested. Make SOPs available to sampling staff for use and to TCEQ staff during an audit.

QAPP Maps

Include maps in the QAPP and in any amendments involving changes to sampling sites. QAPP maps need to label sampling sites covered under the QAPP, streams, reservoirs, major roads, and

9. www.tceq.texas.gov/publications/rg/rg-415

10. www.tceq.texas.gov/publications/rg/rg-416

cities, as appropriate. The maps are for illustrative purposes only and should include the recommended disclaimer, found in the QAPP shell.

Draft QAPPs

Basin-wide QAPPs

Send draft basin-wide QAPPs to the TCEQ CRP project manager electronically by June 1 of odd-numbered years. The project manager sends the draft to TCEQ reviewers. Reviewers at TCEQ include, but are not limited to, the project manager, the CRP project QA specialist, and the lead CRP QA specialist. The TCEQ CRP project manager compiles TCEQ reviewer comments and returns the comments to the planning agency project manager within 30 days of QAPP receipt. Respond to all TCEQ comments, note how the comment was addressed, or explain why the comment was not addressed. Resubmit a revised draft QAPP with all comments addressed within 30 days. QAPP drafts that do not address all reviewer comments may not be accepted by the TCEQ CRP project manager. Submission of a complete draft that undergoes internal review before submission to TCEQ is essential for a streamlined review. Please be aware that when new content is added in subsequent drafts, the review process may become protracted. Contact the TCEQ CRP Project Manager if there are any issues addressing comments to QAPP drafts. The final basin-wide QAPP is due by August 1 of odd-numbered years. More than one exchange of comments and responses may be necessary to achieve approval to proceed from all parties at the planning agency and TCEQ; however, the project manager may schedule a meeting with the planning agency and other TCEQ reviewers to address comments if there is a second exchange of comments.

Do not collect signatures or letters of adherence until the TCEQ CRP project manager indicates the QAPP is complete and ready for final approval.

Approval, Signature, and Distribution of Basin-Wide QAPPs

After TCEQ has given approval of the QAPP, submit a searchable .pdf, .doc or, .docx version of the QAPP, an .xls or .xlsx version of Appendix A7, and any other additional documents to the TCEQ CRP project manager. The planning agency CRP project manager will send the document out to all signatories requesting approval and signatures. Required signatures are designated on the basin-wide QAPP shell document. Additional signatures can be added as needed (e.g., subparticipants). Laboratories sign all QAPPs to ensure laboratories are involved in the development of QAPPs. Signatories may email scans of the signature pages to the planning agency project manager.

The planning agency emails searchable .pdf copies of planning agency, laboratory, and subparticipant signature pages to the TCEQ CRP project manager. After signature pages are received by TCEQ, the TCEQ CRP project manager will route a copy for TCEQ signatures. TCEQ retains one signed copy of the QAPP. The TCEQ Data Management and Assessment staff uploads a final copy of the QAPP to SWQMIS (the Surface Water Quality Monitoring Information System database maintained by TCEQ), where it is available to users.

The planning agency will distribute the final, signed QAPP to all appropriate planning agency staff, laboratory staff, and subparticipants. The TCEQ CRP project manager distributes copies to TCEQ personnel indicated on the distribution list. Secure written acknowledgement of receipt of the QAPP from all signatories. If an entity participates in CRP sample collection or analysis and is not a signatory to the QAPP, an adherence letter is required stating the subparticipants' receipt of the document and commitment to requirements contained in the QAPP. **Adherence letters are not required for entities who sign the QAPP.** An example adherence letter is provided in the QAPP shell document. Maintain copies of all acknowledgements of receipt and all adherence letters as part of the project's quality assurance records.

Copies of all adherence letters must be sent to TCEQ no later than 60 days after TCEQ approval of the QAPP, and prior to any monitoring event.

QAPP Amendments

Project changes requiring QAPP amendments include changes to:

- Analytical procedures
- Table A.7
- Limits of quantitation (see Task 2, for a definition) (LOQs)
- NELAP accreditation
- Sampling sites
- Sampling schedule
- Anything that would affect the data generated by the project
- Project organization, etc.

QAPP amendments are contract deliverables. Submit amendments to TCEQ on an "as needed" basis but before the changes are implemented. Provide a justification and summary of the changes as specified in the QAPP amendment shell. Also provide the amended QAPP Sections. **Do not implement changes until the amendment is fully executed.** In some cases, particularly when a QAPP amendment is the corrective action required to resolve a non-conformance, a data correction request may also be necessary to correct previously submitted data.

Many QAPP amendments involve changes to address existing activities which have been consistent with program requirements all along, but correct information was not included or was incorrect in the original QAPP (e.g., not all stations/parameters are included in the QAPP and amendments). **Do not "backdate" these amendments.** The QAPP amendment serves as a portion of the corrective action process and should be documented as a part of the corrective action plan (CAP).

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

Required signatures are designated on the QAPP shell document. Add signatures as needed (e.g., subparticipants).

Signatures may be provided by hand, either by mailed or scanned searchable .pdf files sent from participants to the TCEQ CRP project manager, or by electronic review. To streamline the amendment process, there is a procedure for electronic review and approval of some QAPP amendments. The steps for the process are as follows:

- The planning agency e-mails the TCEQ CRP project manager an amendment.
- TCEQ reviews the amendment.
- TCEQ CRP project manager provides comments to the planning agency project manager or indicates that the amendment can be approved. The planning agency will respond to TCEQ comments and revise the amendment accordingly. If comments are not satisfactorily addressed after the second round of comments and substantial comments remain, a meeting will be scheduled by the TCEQ CRP project manager with the planning agency, the project manager, and the TCEQ reviewer (e.g., Lead QA Specialist, Data Management & Analysis staff, etc.), whose comments are not satisfactorily addressed, to resolve the remaining comments. A meeting may not be needed if the remaining comments are relatively minor.
- If an amendment is ready to be approved, the TCEQ CRP project manager initiates an email "signature page" and sends the e-mail to all signatories.
- Each signatory "replies to all" for the most recent email indicating approval, providing an email "trail" to show all approvals on a single email thread.

When the TCEQ CRP project manager receives the final approvals, they email the completed signature page and amendment to the signatories.

The planning agency secures adherence letters from affected subparticipants of its QAPP stating the subparticipants' commitment to requirements contained in the QAPP amendment. An example letter is provided in the QAPP shell document. QAPP adherence documentation should be maintained as part of the project's quality assurance records. Adherence letters are not required for entities who sign the QAPP amendment.

Send copies of all adherence letters to TCEQ CRP project manager no later than 60 days after TCEQ approval of the QAPP amendment, but prior to any monitoring event.

The planning agency distributes a searchable copy of QAPP amendments to all personnel on the distribution list.

Annual QAPP Updates, Including Appendix B: Monitoring Schedule Update

Because the basin-wide QAPP is effective for two years, the monitoring schedule in Appendix B of the basin-wide QAPP needs to be updated for the second year of the biennium, following the annual coordinated monitoring meeting. The QAPP amendment should include a summary of changes to the monitoring schedule, revised maps, and any additional changes to the QAPP that are required at that time. Send the mid-biennium amendment via e-mail to the TCEQ CRP project manager by June 1, in the even numbered year. Review comments will be sent to the planning agency project manager within 30 days of QAPP receipt. The planning agency must modify and resubmit the document within 30 days. The final revision is due by August 1 of the even numbered year.

Project Oversight

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

- Work is accomplished in accordance with planning documents.
- Data submitted meets programmatic data quality objectives.
- Necessary corrective actions are implemented effectively.

Document project oversight requirements in the QAPP, Section C1, Assessment and Response Actions.

Planning Agency Oversight Requirements

Planning agencies are also tasked with conducting status monitoring which involves the continual evaluation of programs or projects to ensure they are being conducted as planned and documented. Oversight activities are described in the following sections. Include these oversight activities in quarterly progress reports.

Status Monitoring

Status monitoring involves the continual evaluation of programs or projects to ensure they are conducted as planned in the QAPP. This type of oversight is specified in the QAPP to ensure that planning agency project managers perform a continual review of quality assurance activities over the course of the biennium. This type of monitoring may be a formal management review or a less formal review of QA activities. At a minimum, the planning agency project manager should request a written status of QA activities from staff on a quarterly basis. This includes, but is not limited to, laboratory NELAC accreditation status, deficiencies, and corrective actions.

Laboratory Oversight

The planning agency project manager is responsible for ensuring any laboratory generating data for the CRP is audited by its laboratory quality assurance staff for conformance to laboratory SOPs, applicable methods, and other specific requirements defined in the applicable QAPP and in its quality system standard. At a minimum, conduct a limited review of laboratory operations associated with verifying that the laboratory is following the QAPP specifications and is providing the needed information for verifying and validating data on a regular basis. Perform this limited-scope review or audit so laboratory-client communications remain open, and the laboratory understands client requirements under the CRP.

Subparticipant Oversight Requirements

Planning agencies are required to oversee the activities addressed in their QAPPs and must conduct formal audits at least once during the contract cycle of all subparticipants who conduct field monitoring. Subparticipant audits are contract deliverables. If all work is performed by the planning agency (e.g., there are no subparticipants participating in the basin's CRP program), these audits are not required. Negotiate the timing and scope of oversight activities, and document in the QAPP.

There are two acceptable types of subparticipant field monitoring audits:

- Readiness reviews
- Monitoring systems audits

Perform at least one audit at the subparticipant's office, field station, or other appropriate location at least once during each contract cycle (biennium), in the case of on-going projects; or once during a project's lifetime, in the case of short-lived special studies. A readiness review is appropriate when a new subparticipant or a new contractor is joining the project; it allows project management to assess their understanding of and adherence to applicable guidance for the CRP prior to the initiation of data collection.

Readiness reviews may also be useful in cases of high staff turnover or prior to beginning a special project. Monitoring systems audits (MSAs) are appropriate to assess the ongoing conformance of established CRP partners and participants to the CRP guidance.

The Monitoring Systems Audit Checklist is available on the [Clean Rivers Program: Quality Assurance](#)¹¹ webpage. Modify the checklist as needed to accommodate readiness reviews. The planning agency reviewer must be familiar with the QAPP, field standard operating procedures, and data management protocols. The individual responsible for ensuring readiness reviews are completed is identified in the QAPP, Section A4, Description of Responsibilities.

11. www.tceq.texas.gov/waterquality/clean-rivers/qa/index.html

Readiness Review

A readiness review is an evaluation to determine if all components of the project are in place before work begins. This review is the preferred assessment activity to evaluate a subparticipant's ability to adhere to QAPP requirements and implement any necessary corrective actions before data collection commences. The process is designed to evaluate performance and effectiveness of sampling processes from collection through final result reporting, including (as applicable):

- Minimum documentation.
- Adequacy of facilities and equipment.
- Instrument calibration procedures and logs.
- Field measurement procedures.
- Sample collection procedures.
- Biological sampling procedures.
- Sample handling and analysis procedures.
- Data verification and validation procedures.
- Records handling and retention.
- Data management procedures.

Monitoring Systems Audit

MSAs can be performed at any time during the lifetime of a monitoring program or project and are required at least once per biennium. A MSA is a thorough and systematic technical systems audit involving an on-site qualitative review of monitoring activities. The auditor examines facilities, equipment, personnel, training procedures, data management, and record keeping for conformance with the QAPP. This audit can verify that applicable elements of the technical system are developed, appropriate, documented, and implemented in accordance with project and program specifications. Audits add value to a quality system by promoting and supporting continuous improvement. The audit process is designed to evaluate the sampling process from collection through final result reporting. You can find the Monitoring Systems Audit Checklist on the Clean Rivers Program Quality Assurance webpage and is included as Exhibit 2D in this document. Adapt the checklist as necessary based on the audit scope.

Data Traceability Exercises

Data traceability exercises document the completion of the quality process from sampling collection through data review and final reporting. Data traceability reviews can be conducted during an MSA to provide oversight of subparticipants that complete any portion of data review and validation. Data traceability exercises may also be performed at any point during the contract period to evaluate data management performance. The Data Traceability Review Template is on the CRP Quality Assurance webpage.

Report and Response

Provide the audited organization with a report within 30 days of a readiness review, MSA, or data traceability exercise. The report should state if no negative findings were identified. If negative findings are identified, they must be reported. Reference specific requirement(s) in a primary reference source (the QAPP, SOPs, SWQM Procedures Manual, the CRP Guidance, the CRP Contract and Workplan, etc.), and document the evidence that led to the negative findings. Include additional information regarding the negative findings along with observations. The audited organization must then respond to the report in writing within 30 days. Minimum responses require:

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

An Audit Response template is available in Exhibit 2E and should be used when responding to an audit report. Audit reports and responses are deliverables to the TCEQ CRP project manager with the quarterly progress report no later than the quarter following the one in which the audit was conducted.

Corrective Action Process for Deficiencies

Planning agencies are responsible for addressing issues that may affect data quality. Procedures are in place to help planning agencies track, address, and report deficiencies effectively without imposing unnecessary requirements. Some organizations use the term “non-conformances” rather than “deficiencies,” and we find that the terms can be used interchangeably.

Any deviation from the QAPP, SWQM Procedures, SOPs, or Data Management Reference Guide is a deficiency. Deficiencies may invalidate resulting data and may require corrective action. If the deficiency is caught in time to collect replacement samples or reanalyze existing samples, that would be the ideal scenario. Deficiencies are documented in logbooks, field data sheets, etc. by field or laboratory staff. It is the responsibility of the planning agency project manager, in consultation with the planning agency Quality Assurance Officer (QAO), to ensure that the actions and resolutions to the problems are documented and that records are maintained in accordance with the QAPP. In addition, the TCEQ CRP project manager will be notified of these actions and resolutions in the quarterly project progress reports and by completion of a CAP. In instances where data quality is affected by the deficiency, notify the project manager within 72 hours.

Planning agencies must address deficiencies associated with:

- Sampling method or design (e.g., samples not preserved in the field).
- Sample tracking procedures (e.g., hold times for bacteria samples expired, bacteria samples not collected in sterile bottles).
- Analytical method requirements (e.g., post calibrations not performed, or laboratory methods changed without QAPP amendment).
- Quality control requirements (e.g., blank contamination or blanks not collected at required frequency).
- Data traceability (documentation of data or metadata).

Corrective Action Plans should:

- Identify the problem, nonconformity, or undesirable situation.
- Document any immediate remedial actions taken.
- Identify the underlying cause(s) of the deficiency.
- Identify whether the problem is systematic; likely to recur or to occur in other areas.
- Identify personnel responsible for completing corrective actions.
- Establish timelines and provide a schedule for implementation of corrective actions.
- Identify any effected data and determine appropriate data correction procedures.
- Document the corrective actions completed.

The flow chart in Exhibit 2A, Corrective Action Process for Deficiencies, illustrates the process. The CAP form is available on the CRP Quality Assurance webpage and in Exhibit 2C of this document. Planning agencies may choose to use the forms provided or devise their own system and set of forms (as long as they meet the minimum requirements described in this document).

Periodic status monitoring ensures CAPs effectively address previous deficiencies and prevent their recurrence.

CAP status is a part of the quarterly progress report deliverable. See Exhibit 2B, Corrective Action Status Table for more information. Document deficiencies leading to data loss on Data Summaries when submitting data sets.

Data Review, Verification, and Validation

A well-defined and documented system of data review ensures the validity of data submitted to TCEQ. The CRP defines and recognizes the two terms **verification** and **validation** as they are part of NELAP terminology.

- **Verification** is confirmation by examination and provision of evidence that specified requirements have been met. It refers to the data review processes used to determine data completeness, correctness, and compliance with technical specifications contained in applicable documents (e.g., QAPPs, SOPs, quality assurance manuals (QAMs), analytical methods, NELAP Accreditation).
- **Validation** is the confirmation by examination and provision of objective evidence that the particular requirement for a specific intended use is fulfilled. It refers to a specific review process that extends the evaluation of a data set beyond method and procedural compliance (e.g., data verification) to determine the quality of a data set specific to its intended use.

Review all data obtained from field and laboratory measurements, verify for conformance to technical criteria, and validate against performance specifications. Only data supported by appropriate QC data, and which meet applicable project specifications are considered acceptable for reporting to TCEQ and for entry into SWQMIS.

Describe the specifics of data review in Section D1 of the QAPP and specify responsible parties in Section A4. In general, there are levels of review to be performed by field staff and by laboratory staff. Field staff usually review field data, and laboratory staff review laboratory data. Subparticipant data managers or QAOs, and planning agency data managers or QAOs review data after field and laboratory data are combined into a data set.

Develop and use checklists that facilitate data review and address the various levels of review (see Table 2-1: Verification and Validation Tasks). Develop checklists for field data review that incorporate the various requirements defined in TCEQ's *Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods* (RG-415) and in the QAPP so that the data review tasks associated with field data can be accomplished. Develop a lab data review checklist to facilitate data review, analogous to the checklists used for field data review. Similarly, the planning agency should prepare a checklist for use in reviewing the data after the data set is assembled that speaks to data usability.



Document QAPP deficiency or non-conformances and submit the information to the TCEQ CRP project manager with any affected data. The Data Summary is the appropriate communication tool between the planning agency and the project manager.

Task 4 discusses data formatting, report generation, and data validation topics.

Table 2-1: Verification and Validation Tasks^a

| Data to be Verified | Field Task | Laboratory Task | QA Task | Lead Organization Data Manager Task |
|---|-------------------|------------------------|----------------|--|
| Sample documentation complete; samples labeled; sites identified | | | | |
| Field QC samples collected for all analytes as prescribed in the TCEQ <i>SWQM Procedures, Volume 1: Physical and Chemical Monitoring Methods</i> (RG-415) | | | | |
| Standards and reagents traceable | | | | |
| Chain of custody complete and acceptable | | | | |
| NELAP accreditation is current | | | | |
| Sample preservation and handling acceptable | | | | |
| Holding times not exceeded | | | | |
| Collection, preparation, and analysis consistent with SOPs and QAPP | | | | |
| Field documentation (e.g., biological, stream habitat) complete | | | | |
| Instrument calibration data complete | | | | |
| QC samples analyzed at required frequency | | | | |
| QC results meet performance and program specifications | | | | |
| Analytical sensitivity (LOQ and AWRL) consistent with QAPP | | | | |
| Results, calculations, transcriptions checked | | | | |
| Laboratory bench-level review performed | | | | |
| All laboratory samples analyzed for all scheduled parameters | | | | |
| Corollary data agree | | | | |
| Nonconforming activities documented | | | | |
| Outliers confirmed and documented; reasonableness check performed | | | | |



| | | | | |
|--|--|--|--|--|
| Dates formatted correctly | | | | |
| Depth reported correctly and in correct units | | | | |
| TAG IDs correct | | | | |
| TCEQ Station ID number assigned | | | | |
| Valid parameter codes | | | | |
| Codes for submitting entity(ies), collecting entity(ies), and monitoring type(s) used correctly | | | | |
| Time based on 24-hour clock | | | | |
| Check for transcription errors | | | | |
| Sampling and analytical data gaps checked (e.g., all sites for which data are reported are on the coordinated monitoring schedule) | | | | |
| Field instrument pre- and post-calibration results within limits | | | | |
| 10% of data manually reviewed | | | | |

^a Insert the position of the person responsible for each task in the table. This example table may not contain all the data review tasks being conducted. Please provide all appropriate information for your program.

TCEQ Oversight Requirements

TCEQ Laboratory and Monitoring Systems Audits

TCEQ performs audits of planning agencies as determined by a risk-based assessment.

CRP-associated laboratories are assessed once every two years by their laboratory accrediting body. The audits assess compliance with the NELAC Institute (TNI) standards, and include reviews of facilities, equipment, record-keeping, chain-of-custody records, adherence to approved QA planning documents, and SOPs. The TCEQ CRP project manager, Project QA Specialist, or Lead QA Specialist may provide input into this process if deemed appropriate by the Laboratory Inspector with the laboratory accrediting body. The planning agency will report audit findings that impact CRP to the project manager if significant corrective action is needed (i.e., if data is impacted). The project manager will notify their management chain (Section Manager and above) if significant

corrective action is needed. Otherwise, audit reports are maintained by the TCEQ Quality Assurance Team in the Office of Compliance and Enforcement.

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

Specific CRP Laboratory Requirements

Ambient Water Reporting Limits (AWRLs)

For surface water to be evaluated for compliance with Texas Surface Water Quality Standards (TSWQS) (30 TAC Chapter 307) and screening levels [[Guidance for Assessing and Reporting Surface Water Quality in Texas](#)¹² (TCEQ, SFR-127)], reporting limits for analytical data **must be set at or below** specified levels. To ensure data are analyzed at or below these levels, the CRP established required reporting specifications for AWRLs. The parameters for which AWRLs have been established are available on the [Clean Rivers Program: Quality Assurance](#)¹³ webpage.

While the AWRL is the program-defined reporting specification for each analyte, most laboratories report data based on the concept of a LOQ. A LOQ is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The following requirements must be met 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 the QAPP.
- Find measurement performance specifications for these samples in Appendix A.
- The requirements for lab control check samples are described in Section B5 of the QAPP shell.

Note: *Exceptions can, and have been made for unique water bodies, basins, and laboratories to raise the LOQ above the AWRL. Discuss these instances with your CRP project manager.*

12. www.tceq.texas.gov/downloads/water-quality/assessment/integrated-report-2022/2022-guidance.pdf

13. www.tceq.texas.gov/waterquality/clean-rivers/qa/index.html

Laboratory control samples (LCS) should be run near the mid-point of the calibration curve for each analyte.

Authorized Laboratory Methods

Analytical methodologies for general standards attainment sampling and assessment procedures are specified in the TSWQS (30 TAC Section 307.9). Planning agencies should refer to the TSWQS for additional information.

Find more information on EPA's most recent updates of approved methods at [EPA's Methods Update Rule webpage](#).¹⁴ Requirements for analytical methodologies are specified in the QAPP shell document.

Statistical Control of Precision and Bias

Analytical laboratories must have a statistical process in place to review results as applicable to control on-going performance. To generate data for the CRP, the laboratories' control limits must be set and controlled within the bounds set by the measurement performance specifications as defined in Table A7 of the QAPP. Precision is determined by analyzing duplicate samples, which can be either a laboratory control sample duplicate, matrix spike duplicate, or sample duplicate; the type of duplicate selected is usually determined by the method. See specifications as defined in Table A7 of the QAPP. The most common method of statistical process control involves the use of control charts as described in *Standard Methods for the Examination of Water and Wastewater* or the *EPA Handbook for Analytical Quality Control in Water and Wastewater Laboratories*. (Computer-generated lists or databases with values, limits, and trends may be used as an alternative to control charts.)

Laboratory Test Reports

Laboratory test reports (if applicable for routine water quality data analysis) should be clear, unambiguous and, at a minimum, contain the information specified in the TNI Standards. TNI requires the information with test reports even if the data are transmitted from the laboratories in event or result format unless the laboratory has valid reasons for not doing so. In addition to the specified information, test reports for the CRP should include project-specific quality control results such as equipment and trip blank results, and bacteria holding time, as applicable. It is important for laboratories to provide narrative information about why results were not compliant with specifications as stated in the "Laboratory Data Review" section of this guidance document. Without this information, planning agency data management staff cannot verify and validate data and provide required information on the data summary when data are submitted to TCEQ. Copies of test reports are reviewed during MSAs.

14. www.epa.gov/cwa-methods/methods-update-rules

Information regarding standard test report format is contained in the QAPP shell document. Additional information may be requested.

Laboratory Data Review

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

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

Website Deliverable

Post certain sections of approved QAPPs on the planning agency's CRP webpage to enable the public to know and understand the water quality monitoring being conducted in their basin. Include:

- Monitoring programs or project objectives.
- Measurement performance specifications (e.g., Table A7).
- QAPP amendments.
- Special study appendices.

Quality Assurance Training

The CRP encourages all applicable planning agency personnel and in-kind contributors to obtain training on topics associated with this task. This is especially critical to ensuring data are collected using TCEQ-approved policies and procedures. Special accommodations may need to be made to ensure in-kind contributors get appropriate training. All non-CRP training events require prior approval to be considered for reimbursement for both training fees and any associated travel expenses.

Itemize all training on quarterly progress reports and include on reimbursement requests accordingly.

Special Project Planning

All applicable parties, including TCEQ staff, should thoroughly discuss special study and permit support monitoring projects before workplans are finalized. If planning agencies intend to conduct multiple special projects under subcontract, they should carefully consider staggering projects over the biennium, with consideration of variable funding. Allocate sufficient time to properly plan and execute the QAPP before data collection and reporting. Adequate data collection, report writing, or other project components may necessitate project components being carried into the next biennium. Determine this before executing the work plan. Considerations for designing monitoring plans are in Task 3—Monitoring. The formal project planning process has benefits that include:

- Communication and input from all involved parties to optimize data collection efforts.
- Data collected are of the type and quality appropriate to their intended use and may support decision making.
- Existing data use.
- Data management conditions, such as data coding, verification and validation, manipulation, and transfer.
- Information to be documented in the QAPP appendix to expedite review and approval so projects can begin in a timely manner.

Contact TCEQ CRP project managers to indicate intent and desire to conduct a planning meeting. Conduct the meeting at least 90 days before the planned sampling date. The project manager will include appropriate TCEQ staff in planning activities if additional specialized knowledge will aid in the planning process.

The project planning meeting objective is to implement a systematic planning process based on standard QAPP sections. The decisions made during the planning meeting will be incorporated by the planning agency into a Special Study QAPP Appendix.

The planning agency project manager will play the lead role in respect to planning projects and is responsible for establishing the planning team in consultation with TCEQ, scheduling meetings, distributing meeting materials before meetings, facilitating meetings, and preparation and distribution of meeting minutes.

Include a proposed scope of work with maps of the study area in meeting preparation materials. **Do not begin drafting the QAPP before the meeting.** You may conduct meetings in-person in Austin, at the planning agency, or via a virtual meeting. The outcome of the planning meeting should be a set of project goals and objectives, and appropriate SWQMIS data codes. Develop a QAPP within 30 days of the meeting. Detailed meeting minutes are a Task 2 deliverable.

QAPP Appendices

Appendices are prepared to itemize additional work or projects not initially described in the original QAPP. Planning agency project managers develop appendices in coordination with TCEQ CRP project managers, the Project QA Specialist, the Lead QA Specialist, and other technical specialists (laboratories, consultants, other agency water programs, etc.), as appropriate. **The CRP QAPP shell does not apply to and should not be used for data collection for federally funded programs or projects.**

Special Study or Permit Support Monitoring

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

The TCEQ CRP project manager tracks the deliverables and forwards QAPP appendices to the TCEQ reviewers. After the document has been reviewed by TCEQ, the project manager compiles and sends comments to the planning agency. TCEQ is committed to an expeditious review and approval of these documents and retains the right to review all submissions for up to 30 days. Draft QA documents are not considered approved or completed until all parties have signed the final QAPP appendix.

Use of Acquired Data

Data which are not newly generated as part of a project are called “existing,” “historical,” “secondary,” “non-measurement,” “non-direct,” or “acquired” data. Section B9 of the basin-wide QAPP shell document addresses non-direct measurement data sources. Historical routine data should not be submitted through the CRP.

In some cases, acquired data will be co-mingled with new data collected under a QAPP. Acquiring data can allow data needs to be met despite time and resource constraints. The use of acquired data may also provide more detailed and exhaustive information than the project could produce otherwise, allowing for a better understanding of the situation. Sources of data include other projects, databases, reports, etc. The sources and characteristics of acquired data must be specified in Section B9 of the QAPP.

To include acquired data, the planning agency should consider and describe the following of the data collection:

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

For CRP projects, it is important to verify that data are consistent with TCEQ requirements, and therefore, comparable to other data, allowing for comparisons. The EPA [Guidance for Quality Assurance Project Plans](#),¹⁵ EPA QA/G-5 provides additional information on the use of acquired data.

15. www.epa.gov/quality/guidance-quality-assurance-project-plans-epa-qag-5



Exhibit 2A.

Corrective Action Process Flow Chart

Figure 2-1. Corrective Action Process for Deficiencies

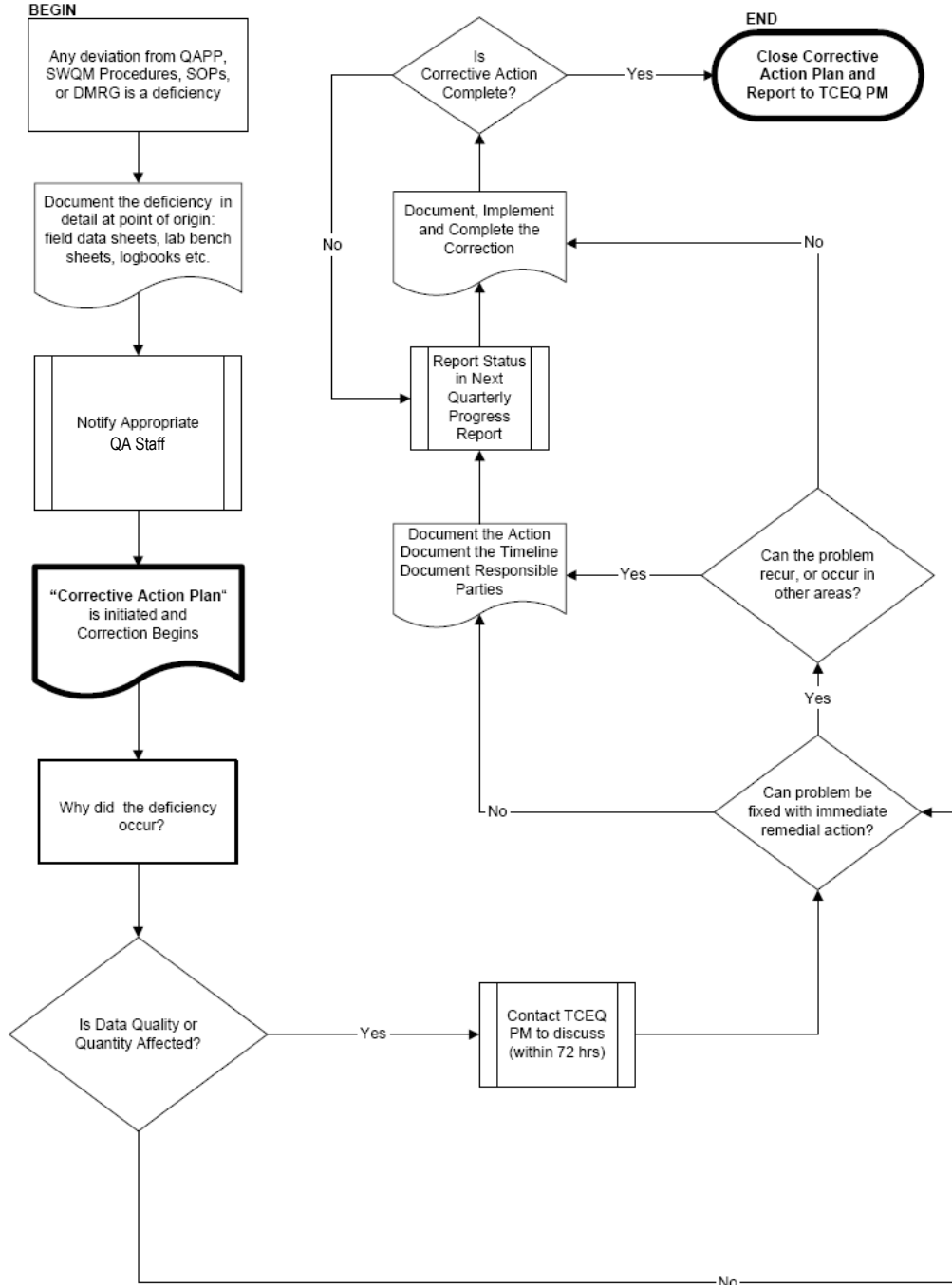




Exhibit 2B. Corrective Action Status Table



Instructions: This table provides a format that planning agencies can use to track the status of corrective actions. The planning agency will need to log each corrective action in the table and complete the corresponding columns for each corrective action. The planning agency is not required to submit a corrective action status table on this template, but the table must contain the elements presented in the template.

Table 2-2. Corrective Action Status Table

| Corrective Action # | Date Issued | Description of Deficiency | Action Taken | Date Closed |
|----------------------------|--------------------|----------------------------------|---------------------|--------------------|
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Exhibit 2C. Corrective Action Plan Form



Instructions: This form provides a format to show how the performing party addressed a deficiency or non-conformance. The planning agency should fill out this form to document their CAP to address a deficiency or non-conformance. The planning agency is not required to submit a CAP on this template, but the plan must contain the elements presented in the template.

Table 2-3. Corrective Action Plan Form

Corrective Action Plan

| |
|--|
| <p>Issued by: _____ Date Issued _____ Report No. _____</p> |
| <p>Description of deficiency [Clearly describe the deficiency or non-conformance.]</p> |
| <p>Root Cause of deficiency [Clearly state the root cause for the deficiency or non-conformance.]</p> |
| <p>Programmatic Impact of deficiency [Describe the evidence reviewed to determine the impact of the deficiency or non-conformance on the program or data. What timeframe was reviewed? Was data reviewed for anomalies or step changes? Did the deficiency or non-conformance result in the program not meeting customer requirements? Note: A statement of "no impact" to reported data must be supported with a statement that describes exactly what was reviewed and how it was reviewed.]</p> |
| <p>Does the seriousness of the deficiency require immediate reporting to TCEQ? If so, when was it?</p> |
| <p>Corrective Action to address the deficiency and prevent its recurrence. [What will be done to correct the deficiency or non-conformance? Were all parts of the finding addressed? Who is responsible for implementation? Will procedures or forms be created or revised? Will training be given? (Training is required if procedures and forms are created or revised.)]</p> |
| <p>Proposed Completion Date for Each Action [When will the Corrective Action be completed? If multiple Corrective Actions are proposed, a timeframe (month and year) must be included for each action. Is the timeframe reasonable? (In general, 30-90 days is reasonable. An explanation must be given when more than 90 days are needed.)]</p> |



Individual(s) Responsible for Each Action

[Clearly describe who will do what to address the Corrective Action.]

Method of Verification

[How will the Corrective Action be documented? If multiple Corrective Actions are proposed, the means to document each action must be included.

(This corrective action plan is not documentation of the Corrective Action(s). This section must identify the specific document(s) used to document the action, e.g., revised SOP, forms, calendar, training records, etc.)]

Date Corrective Action Plan Closed?

[This is the date when the Corrective Action Plan has been completed. This cannot be recorded until the Corrective Action Plan is closed.]



Exhibit 2D. Clean Rivers Program Audit Checklist



Instructions: The checklists (Table 2-4 and Table 2-5) can be used to conduct Clean Rivers Program on-site project oversight and assessment activities. The checklist (Table 2-5) is designed to evaluate the entire data collection process through final reporting of results, and to detect deficiencies and non-conformances so corrective actions can be taken. Formal oversight, including readiness reviews and MSAs, of all planning agency subparticipants is required under the CRP. The checklist (Table 2-5) is provided in sections and should be modified, if needed, to fit the scope of either a readiness review, or an MSA. Specific sections in the checklist (Table 2-5) can be used by themselves to do an audit targeted towards an extremely specific function. Following the assessment, the completed checklists (Table 2-4 and Table 2-5) should be used to generate a report for use by the auditor and auditee.

Table 2-4. Clean Rivers Program Audit Checklist Introduction

| | |
|---|--|
| Auditing Agency | |
| Name of Auditor(s) | |
| Subparticipant | |
| Date | |
| QAPP (including amendment number) in effect at time of audit | |
| Other QAPPs reviewed | |



Table 2-5. Clean Rivers Program Audit Checklist

| Operation | Yes | No | Not Applicable | Comments |
|---|-----|----|----------------|----------|
| Section 1 – Documents (This section requires the examination of completed records. The auditor should record documented evidence in the comment section). | | | | |
| Is there documentation of QAPP distribution, as required by the basin-wide QAPP? | | | | |
| Is there documentation of QAPP amendment and appendix distribution, if applicable? | | | | |
| Are there copies of QAPP adherence letters on record for all subparticipants? Or, have subparticipants signed the QAPP and amendments? | | | | |
| Does the Quality Assurance Officer (QAO) keep a non-conformance record and supervise corrective action procedures as described in the QAPP? | | | | |
| Have any corrective action reports been generated associated with the current QAPP? | | | | |
| Has the QAO verified that training of field staff is documented? | | | | |
| Section 2 – Facility and Equipment (This section requires the examination of completed records. The auditor should record documented evidence in the comment section) | | | | |
| Does the facility have adequate storage for field sampling equipment? | | | | |
| What field equipment is available? (specify) | | | | |



| | | | | |
|---|--|--|--|--|
| Are multi-probe instruments stored in temperature-controlled environments? | | | | |
| Are probes and field equipment stored dry, with connectors separated, and open to the air? | | | | |
| Are multi-probe sensors rinsed upon return from the field, and kept moist during storage? | | | | |
| Are there thermometers in ovens, incubators, and refrigerators? | | | | |
| Are thermometer temperatures checked and documented daily (or as required), and are units adjusted? | | | | |
| Are thermometers calibrated annually? | | | | |
| Is deionized or other laboratory pure water available? (describe) | | | | |
| Is deionized water conductivity checked and documented daily? | | | | |
| Are balances and weights calibrated, annually? | | | | |
| Section 3 – Calibration and Maintenance of Field Instruments (This section requires the examination of completed records. The auditor should record documented evidence in the comment section) | | | | |
| Where are instrument calibrations documented? | | | | |
| Are calibrations performed in a temperature-controlled environment? | | | | |
| Are calibration standards stored in temperature-controlled environments? | | | | |
| Are commercial or prepared standards used for conductivity calibration? | | | | |
| Are commercial or prepared standards used for pH calibration? | | | | |



| | | | | |
|---|--|--|--|--|
| Are calibration standards used before their expiration date? | | | | |
| Are buffers and standards dated upon receipt, and when opened? | | | | |
| Is the following calibration sequence followed? (specific conductance, pH, dissolved oxygen (DO)) | | | | |
| Is each sensor allowed to equilibrate for two minutes, or until stable, before calibrating? | | | | |
| Is the multi-probe instrument calibrated with a standard in the range of the specific conductance of water to be sampled? | | | | |
| Are pH buffers of 4.0 and 7.0 used to calibrate when measuring pH in naturally acidic water? | | | | |
| Are pH buffers of 7 and 10 used to calibrate when measuring pH in naturally basic waters? | | | | |
| Is DO calibration performed by % saturation? | | | | |
| Is DO calibration performed by mg/L? | | | | |
| How is the local barometric pressure determined? (specify) | | | | |
| If a barometer is available, is it within calibration? | | | | |
| Except for coastal areas, how is the local altitude obtained so barometric pressure may be de-corrected? (specify) | | | | |
| During DO sensor calibration: | | | | |
| a. Is the water level just below the O-ring? | | | | |
| b. Are water droplets on the membrane removed with a tissue? | | | | |



| | | | | |
|---|--|--|--|--|
| c. Is a lid or cap placed over the calibration cup to limit breezes? | | | | |
| Are post-calibration checks performed after every sampling run? | | | | |
| Are post-calibration check limits adhered to? | | | | |
| Based on the examination of calibration logbooks, are post- calibration checks acceptable? | | | | |
| Are records of maintenance documented? Where? | | | | |
| Explain the routine maintenance conducted on field equipment. | | | | |
| Are spare parts or backup equipment maintained? | | | | |
| Section 4 – Documentation (This section requires the examination of completed records. The auditor should provide documented evidence in the comment section) | | | | |
| Is field training documented? | | | | |
| Does the QAO have records of field staff training? | | | | |
| Are project staff members those documented in the QAPP? | | | | |
| Is a QAPP distribution list maintained? | | | | |
| Are documents retained and handled in accordance with the current QAPP? | | | | |
| Is documentation citing sub- participant commitment to the QAPP maintained? | | | | |
| Are the TCEQ SWQM procedures manual, its interim updates, and QAPP available to staff? | | | | |
| Is there a non-conformance process or system to log deficiencies? | | | | |



| | | | | |
|---|--|--|--|--|
| Are corrective action reports prepared to address non-conformances? | | | | |
| Is the monitoring plan in the QAPP followed? | | | | |
| Are field notebook or log entries made in permanent ink? | | | | |
| Are field notebook or log errors corrected with a single line strike-out, dated, and initialed? | | | | |
| Is the field data sheet, or field log used the one specified in the QAPP? | | | | |
| Are the following sample collection activities documented on data sheets, or in field logs: | | | | |
| a. Station ID? | | | | |
| b. Location? | | | | |
| c. Date and time and depth? | | | | |
| d. Sample collector's name and signature? | | | | |
| e. Values for all measured field parameters? | | | | |
| f. Detailed observational data (water appearance, weather, etc.)? | | | | |
| g. Other observational data, as applicable (biological activity, stream uses, unusual odors, missing parameters, etc.)? | | | | |
| Is the chain of custody form used consistent with the form in the QAPP? | | | | |
| Is the following information documented on the chain of custody form: | | | | |
| a. Date and time of collection? | | | | |
| b. Site identification? | | | | |
| c. Sample matrix? | | | | |
| d. Number of containers? | | | | |



| | | | | |
|---|--|--|--|--|
| e. Preservative used? | | | | |
| f. Analyses required? | | | | |
| g. Name of collector? | | | | |
| h. Custody transfer signatures? | | | | |
| Is each sample transfer documented with a signature on the COC form? | | | | |
| Are labels affixed to containers, or bottles marked with indelible ink? | | | | |
| Is the following information labeled on each sample: | | | | |
| a. Site identification? | | | | |
| b. Date and time of sampling? | | | | |
| c. Preservative? | | | | |
| d. Designation of field-filtered? | | | | |
| e. Analysis requested? | | | | |
| Section 5 – Field Analysis | | | | |
| Are in situ or bucket measurements performed on DO, temperature, pH, and conductivity? (In situ measurements should be taken when possible. The auditee should explain why bucket samples are taken.) | | | | |
| If buckets are used for field measurements, is the bucket shaded from sunlight, and temperature recorded immediately after collection, before the sample warms? | | | | |
| When measuring conductivity, is the probe placed carefully in the water to avoid the entrapment of air? | | | | |
| Is salinity reported for estuarine or marine water bodies? | | | | |
| When measuring field parameters, are sensors allowed to equilibrate for at least two minutes before taking readings? | | | | |



| | | | | |
|---|--|--|--|--|
| At what depth are field measurements taken in water bodies less than 1.5 ft deep? | | | | |
| At what depth are field measurements taken in water bodies between 1.5 ft and 5 ft in depth? | | | | |
| Are vertical profiles taken in water bodies >5 ft deep? | | | | |
| Are DO, temperature, pH, and salinity reported to the nearest tenth place? | | | | |
| Is conductivity reported to three significant figures? | | | | |
| Is transparency measured using Secchi disk? If yes, then: | | | | |
| a. When measuring Secchi disk transparency, is the mathematical average computed from the depth at which the disk disappeared and the depth to which it reappeared? | | | | |
| b. In cases of shallow, clear water bodies, is the Secchi disk transparency reported as > the depth of the water body? | | | | |
| Is transparency measured using Secchi tube? If yes, then: | | | | |
| a. In cases of shallow, clear water bodies, is the Secchi tube transparency reported as > the length of the tube? | | | | |
| Is transparency reported to two significant figures? | | | | |
| Is flow severity reported correctly? (Answer – 1=no flow, 2=low flow, 3=normal flow, 4=flood, 5=high flow, 6=dry) | | | | |
| When a flow severity of 1 is reported, is the instantaneous measurement of flow reported as "0.0" cfs? | | | | |



| | | | | |
|---|--|--|--|--|
| If the stream bed holds no water and the flow severity reported as 6 (dry) is any value reported for flow? (Answer-no) | | | | |
| Are days since last significant precipitation recorded? How is this determined? | | | | |
| If it is raining when samples are collected, what is reported for days since last significant precipitation? (Answer - <1day) | | | | |
| Section 6 – Flow Monitoring | | | | |
| Are flow measurements performed? (if answer is no, omit the remaining items in this section) | | | | |
| Is a visual flow estimate made prior to performing the flow measurement? | | | | |
| What type of flow meter is used? | | | | |
| Discuss selection of flow measurement sites. Is laminar flow considered? | | | | |
| If an ideal site is not available, is the cross section modified to provide acceptable conditions? | | | | |
| How is stream width measured? | | | | |
| If the stream is >5 ft wide but ≤10 ft wide, how many cross sections are required? (Answer: 10) | | | | |
| If the stream >10 ft wide, how many cross sections are required? (Answer: 20 to 30) | | | | |
| Are velocity measurements made at the mid-point of each cross section? | | | | |
| Is depth of each cross section determined with a wading rod? | | | | |
| Where in the cross section is velocity determined? | | | | |



| | | | | |
|--|--|--|--|--|
| How much time is allotted for each velocity determination? | | | | |
| Are flow calculations correct? (Review computations) | | | | |
| Section 7 – Field Bacteriological Analysis | | | | |
| Are bacteriological samples collected? <i>E. coli</i> or Enterococcus? | | | | |
| Are bacteriological samples placed on ice immediately upon collection? | | | | |
| Are bacteriological samples collected at a depth of 1 foot in a direction away from the sampler? | | | | |
| What containers are used for bacteriological sample collection? | | | | |
| Are sample bottles for bacteriological analyses not pre-rinsed? | | | | |
| Is there head space in the sample container, so that samples may be shaken prior to analysis? | | | | |
| How and when is sodium thiosulfate added to bacteriological containers? | | | | |
| Are samples analyzed within the 8-hour hold time? | | | | |
| Are incubators maintained at 35° ± 0.5° C for Colilert analysis? | | | | |
| Are dilutions performed to bracket the concentration? | | | | |
| Is a complete log kept with sample location, dilution, counts, analyst, etc. | | | | |
| Is the initial and final incubator temperature checked and recorded? | | | | |
| Is time in and time out of the incubator checked and recorded? | | | | |
| Section 8 – Sample Collection | | | | |



| | | | | |
|---|--|--|--|--|
| Describe types of samples collected (analyses to be performed). | | | | |
| Are water samples for parameters collected consistently with the parameters specified in the QAPP, Table A7? (Auditee should itemize samples collected) | | | | |
| Are samples collected directly from the centroid of flow whenever possible, or is sampling equipment used? (describe) | | | | |
| Is the sample bucket (if applicable) rinsed three times between sites? | | | | |
| Are sampling containers used, as specified in the QAPP? (describe) | | | | |
| Are chlorophyll- <i>a</i> samples collected in amber bottles? | | | | |
| Is sample preservation, including icing, performed in the field, immediately upon collection? | | | | |
| If field splits are collected, are they collected for all samples on a 10% basis, at a frequency of no less than once per week? | | | | |
| Are field equipment blanks collected for metals-in-water samples once per day, or on a 10% basis if more than ten samples are collected in one week? | | | | |
| Is quality-assured sample equipment used for metals-in-water samples? | | | | |
| Are pre-cleaned, certified containers used for metals-in-water samples? | | | | |
| Is a clean hand and dirty hand approach used for dissolved metals-in-water sample collection and filtration? | | | | |
| Are dissolved metals-in-water samples filtered in the field in a clean room (e.g., box) atmosphere? | | | | |



| | | | | |
|---|--|--|--|--|
| Are dissolved metals-in-water samples preserved in the field? What amount and type of acid is used? | | | | |
| What type of equipment is used for sediment analysis? | | | | |
| In cases where wading is possible, is the dredge mounted on a pole rather than on a rope? | | | | |
| After the dredge has accepted the sediment sample, is the dredge gently tipped to one side, and the overlying water decanted? | | | | |
| Is the sediment sample deposited in a clean plastic pan for inspection, prior to be put in a container? | | | | |
| Is only the top aerobic layer or two subsampled and put into the sample container? | | | | |
| Section 9 – Biological Sampling | | | | |
| Describe the type of biological monitoring performed. | | | | |
| Describe training of biological monitors. | | | | |
| Are appropriate staff members included on a current Texas Parks and Wildlife Department scientific collection permit? | | | | |
| Is the field staff in possession of the current permit? | | | | |
| Are electric shocking and seining employed during all fish surveys? | | | | |
| Is electroshocking performed for a minimum 15 minutes? | | | | |
| Are a minimum of six seine hauls performed? | | | | |
| Describe the level of taxonomic identification for fish in comments. | | | | |



| | | | | |
|---|--|--|--|--|
| Describe how voucher specimens are maintained, and questionable specimens are verified in comments. | | | | |
| Are 100 organism subsamples routinely counted for benthic data if kicknets are used to collect? | | | | |
| Describe level of taxonomic identification for benthic data in comments. | | | | |
| Are habitat surveys conducted during each biological event? | | | | |
| Is instantaneous flow measured and recorded for each biological event? | | | | |
| Section 10 – Sample Receipt and Sample Control | | | | |
| Does a system exist for logging in samples, and assigning sample ID numbers? | | | | |
| Is the chain-of-custody record checked to ensure it matches sample labels? | | | | |
| Are sample containers checked to be sure they are intact? | | | | |
| Are specified holding times adhered to? | | | | |
| Are samples stored appropriately? | | | | |
| Is sample access controlled? | | | | |
| Are samples and standards stored separately? | | | | |
| Are samples returned to storage at the end of the day? | | | | |
| Is the temperature monitored in storage units? | | | | |
| Are samples stored at the temperatures described in the QAPP? | | | | |
| Section 11 – Data management, entry, verification, and validation | | | | |



| | | | | |
|--|--|--|--|--|
| Is there a data manager designated to perform data management activities? | | | | |
| Are electronic or physical logs of database activities maintained? | | | | |
| Is there a QAO designated to perform quality assurance and quality control activities related to data management? | | | | |
| Are electronic data entry forms completed and maintained? How are the forms reviewed to ensure they are correct? How is this review documented? | | | | |
| How are hard copy data entry forms completed and maintained? How are the forms reviewed to ensure they are correct? How is this review documented? | | | | |
| How are field data entered into the planning agency database? | | | | |
| How are field data for conformance with the TCEQ <i>SWQM Procedures</i> (RG-415) and QC requirements reviewed? How is this review documented? | | | | |
| How are reviews performed of pre-calibration records and post-calibration error checks to ensure they comply with error limits? How is this review documented? | | | | |
| How are field data calculations, reductions, and transcriptions checked? How is this check documented? | | | | |
| How are lab data entered into the planning agency database? | | | | |



| | | | | |
|---|--|--|--|--|
| How are laboratory data reviewed for conformance with QAPP requirements, including sample handling, chain of custody, analytical and QC requirements, to include documentation, holding times, sample receipt, sample preparation, sample analysis, project and program QC results, and reporting? How is this review documented? | | | | |
| How are lab data calculations, reductions, and transcriptions checked? How is this check documented? | | | | |
| How are reporting limits checked to ensure they are consistent with CRP requirements? How is this check documented? | | | | |
| How are analytical QC information evaluated to determine its impact on individual analyses? How is this evaluation documented? | | | | |
| How are laboratory samples checked to ensure all samples are analyzed for all parameters? How is this check documented? | | | | |
| How are data sets (field and laboratory) evaluated for reasonableness, and for corollary data agreement? How is this evaluation documented? | | | | |
| How are outliers confirmed? How is this confirmation documented? | | | | |
| How are field QC sample results checked to see they were analyzed, and the results are acceptable? How is this review documented? | | | | |
| Are sampling and analytical data gaps checked to ensure data are from sites on the coordinated monitoring schedule? | | | | |



| | | | | |
|--|--|--|--|--|
| What role does the planning agency project manager play in confirming the reportability of data to TCEQ? | | | | |
| What are the verification and validation procedures for entering data from a cooperating partner? | | | | |
| Does the planning agency data manager have review protocols that check for the following: (Explain) | | | | |
| a. Data formatting errors? | | | | |
| b. Record inconsistencies? | | | | |
| c. Parameter code violations? | | | | |
| d. Spelling errors? | | | | |
| e. Duplicate records? | | | | |
| f. Key fields lacking information? | | | | |
| g. Missing values? | | | | |
| h. Outliers? | | | | |
| i. Orphans? | | | | |
| j. Reporting limits not in QAPP? | | | | |
| k. Stations not in QAPP? | | | | |
| l. Parameter codes not in QAPP? | | | | |
| Does the laboratory report contain all elements required by the QAPP? | | | | |
| Are quality-assured data maintained on the planning agency's website? | | | | |
| Describe the data correction process. | | | | |



Exhibit 2E. Audit Response Template

Instructions: Guidance for the audit response is included with each element of the template below to assist the auditee with preparation of an audit response, including corrective action response, (Table 2-6). The auditee is not required to submit an audit response on this template, but the response must contain the elements presented in the template.

Table 2-6. Audit Response Template

| | |
|--|--|
| Finding Number: | |
| Finding: | (Restate finding from audit report.) |
| Root Cause(s): | (Clearly state the root cause(s) for the deficiency or non-conformance.) |
| Programmatic and Data Impact: | <p>(Describe the evidence reviewed to determine the impact of the deficiency or non-conformance on the program or data. What timeframe was reviewed?</p> <p>Was data reviewed for anomalies or step changes? Did the deficiency or non-conformance result in the program not meeting customer requirements?</p> <p>Note: A statement of “no impact” to reported data must be supported with a statement that describes exactly what was reviewed and how it was reviewed.)</p> |
| Corrective Action(s) (CA) to Address the Finding: | <p>(What will be done to correct the deficiency or non-conformance? Were all parts of the finding addressed? Who is responsible for implementation?</p> <p>Will procedures or forms be created or revised? Will training be given? (Training is required if procedures and forms are created or revised.)</p> |
| Timetable(s) for Implementation of CA: | <p>(When will the CA be completed? If multiple CAs are proposed, a timeframe (month and year) must be included for each action.</p> <p>Is the timeframe reasonable? (In general, 30-90 days is reasonable. An explanation must be given when more than 90 days are needed.)</p> |
| Means to Document CA: | <p>(How will the CA be documented? If multiple CAs are proposed, the means to document each action must be included.)</p> <p>(This corrective action plan is not documentation of the CA(s). This section must identify the specific document(s) used to document the action, e.g., revised SOP, forms, calendar, training records, etc.)</p> |



| | |
|---|--|
| <p>Action(s) to Prevent Recurrence (APR) of the Finding:</p> | <p>(What will be done to prevent the deficiency or non-conformance from occurring again?</p> <p>Does the APR address the deficiency or non-conformance globally? (e.g., across all similar activity areas, SOPs, equipment, forms, procedures, etc.)</p> <p>Is the APR distinctly different than the corrective action to address the finding?</p> <p>Who is responsible for implementation?</p> <p>Will procedures or forms be created or revised? Will training be given? (Training is required if procedures and forms are created or revised.)</p> |
| <p>Timetable(s) for Implementation of APR:</p> | <p>(When will the APR be completed?</p> <p>If multiple APRs are proposed, a timeframe must be included for each action.)</p> |
| <p>Means to Document APR:</p> | <p>(How will the APR be documented? If multiple APRs are proposed, the means to document each action must be included.)</p> |
| <p>Verification of Effectiveness:</p> | <p>(How will the CA and APR be verified for effectiveness?</p> <p>Who will verify that the CA and APR are completed? Effective? When will verification be completed? How will verification be documented?)</p> |

Task 3: Water Quality Monitoring

In This Task

| | |
|--|-----|
| General Monitoring Guidance | 124 |
| Deliverables..... | 124 |
| Types of Monitoring..... | 125 |
| Routine Monitoring | 125 |
| Systematic Watershed Monitoring..... | 126 |
| Permit Support Monitoring | 126 |
| Special Studies in Priority Watersheds | 128 |
| Special Studies Mapping..... | 128 |
| Continuous Monitoring | 129 |
| Parameters Monitored | 129 |
| Field Parameters..... | 129 |
| Conventional Parameters | 130 |
| Toxic Substances..... | 130 |
| Bacterial Measurements..... | 131 |
| Biological or Habitat Assessments..... | 131 |
| Ambient Toxicity | 132 |
| Basin Monitoring Planning, Coordination, and Development | 133 |
| Coordinated Monitoring Process..... | 133 |
| Participation in Coordinated Monitoring Meetings | 133 |
| Preparation for Coordinated Monitoring Meetings | 134 |
| Conducting a Coordinated Monitoring Meeting | 135 |
| Maintaining the Monitoring Schedule..... | 135 |
| Exhibit 3A. Special Study Report Components..... | 137 |
| Exhibit 3B. Coordinated Monitoring Meeting..... | 140 |

General Monitoring Guidance

Monitoring programs should address program goals, identify reference and baseline conditions for future comparisons, and address areas that have water quality concerns as identified by Basin Steering Committees and water quality assessments (e.g., Texas Integrated Report for Clean Water Act Sections 305(b) and 303(d), Basin Summary Report). The TCEQ [Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods](#)¹⁶ (RG-415) and the [Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data](#)¹⁷ (RG-416) are essential guides for conducting water quality monitoring. The most current version of the TCEQ [Guidance for Assessing and Reporting Surface Water Quality in Texas](#)¹⁸ should be referenced when determining the amount of data needed for the assessment of various uses. The TCEQ Water Quality Standards Group should be consulted while developing the water quality monitoring schedule to incorporate support for the development of water quality standards.

Basin monitoring programs should provide:

- Monitoring that considers chemical, physical, and biological data collection and evaluation that will advance the ability to identify and locate water quality issues.
- Water quality sampling to allow temporal and spatial analysis of water quality trends.
- Increased data collection for the development of water quality standards.
- Additional knowledge of stream flows.
- Enhanced knowledge of current monitoring techniques.

Cost-effective watershed management decisions must be based on *scientifically valid* data and *complete* assessments of water quality conditions and contributing causes of impact. Water bodies should be selected based on the importance of the resource, risk from pollution, and input from the Steering Committee and TCEQ. Sites are chosen to be representative of the water body or a portion of the water body.

Deliverables

Deliverables for this task include a summary of all the monitoring activities for each quarter with the quarterly progress report. Quarterly status reports and final reports for special studies are included in this task. The status reports must provide information on the activities related to each special study and will be submitted with each quarterly progress report. Special study final reports and BLOB files for biological monitoring will be submitted as designated in the work plan (see outline in Exhibit 3A and the BLOB file guidance and examples in Exhibit 4D).

16. www.tceq.texas.gov/publications/rg/rg-415

17. www.tceq.texas.gov/publications/rg/rg-416

18. www.tceq.texas.gov/downloads/water-quality/assessment/integrated-report-2022/2022-guidance.pdf

The electronic data generated from monitoring will be submitted in the Events and Results format as part of the deliverables for Task 4. Coordinated monitoring efforts will include facilitating a meeting with the other monitoring entities in the basin and communicating statewide CMS updates to the TCEQ CRP project manager.

Types of Monitoring

Monitoring activities can be grouped into five categories. Basin monitoring programs may employ any or all types of monitoring to achieve the stated monitoring objectives. These activities characterize the status of water quality conditions and provide specific data in support of permit and regulatory decisions. The five categories, described below, are:

- Routine monitoring
- Systematic watershed monitoring
- Permit support monitoring
- Special studies (in priority watersheds and mapping)
- Continuous monitoring

Routine Monitoring

Routine monitoring is the traditional type of monitoring designed to delineate overall water quality throughout a river basin and is not intentionally targeted toward any environmental condition or event. A routine monitoring network can provide information about water bodies with high public interest, reference conditions at ecoregion sites, and areas with persistent water quality problems. The monitoring design will be dependent on the actual use of the water body and potential sources of contamination. At a minimum, annual monitoring will include quarterly field measurements, flow measurements (where applicable), indicator bacteria analysis, and conventional chemical parameter analysis. Common objectives of routine water quality monitoring include:

- Collection of surface water data needed for conducting water quality assessments in accordance with TCEQ's *Guidance for Assessing and Reporting Surface Water Quality in Texas*.
- Identifying trends in water quality.
- Monitoring progress in protecting or restoring water quality.

Non-routine monitoring is designed to target specific environmental conditions (e.g., runoff flow, index period, spills). If the objective of the monitoring can only be met under these conditions, then the monitoring should not be considered routine. These data quality objectives should be outlined and discussed in the QAPP so the eventual data use can be determined by the user.

Systematic Watershed Monitoring

Systematic watershed monitoring is similar to routine monitoring; however, sampling is of short duration (one to two years) and designed to screen waters that are rarely monitored. Systematic monitoring has several common objectives including:

- Screening waters that would not normally be included in the routine monitoring program.
- Monitoring at sites to check the status of water bodies (identify improvements or concerns).
- Investigate areas of potential concern.
- Obtain baseline data for the development of water quality standards.

Due to the limited duration for which these data will be collected, the data will be primarily used to determine whether any locations have values above TCEQ's water quality criteria or screening levels, or, in some cases, values elevated above normal. When values are significantly elevated, the planning agency will use this information to determine future monitoring priorities.

This monitoring can follow either a rotational watershed approach or an intensive watershed evaluation. A rotational watershed approach is a plan that divides the river basin into distinct watersheds or, in some cases, sub-watersheds. The watershed areas are then designated for a year or two of monitoring, in succession. Within each watershed, sampling sites are selected that adequately characterize the watershed. An intensive watershed evaluation is similar to the rotational watershed approach except that a specific watershed is selected due to a perceived condition and further information is needed to characterize the water body. Once the information is collected and analyzed, it may indicate the need for a special study which can be designed based on the data collected.

Systematic watershed monitoring will follow the same protocols and standard field and laboratory measurements as routine monitoring, unless otherwise specified in the QAPP. At a minimum, monitoring will usually include quarterly field measurements, flow measurements (where applicable), indicator bacteria analysis, and conventional chemical parameter analysis. If one of the objectives for the systematic data is to have it assessed by TCEQ for the Water Quality Integrated Report, monitoring should be conducted considering the specifications outlined in the most current version of the TCEQ *Guidance for Assessing and Reporting Surface Water Quality in Texas*.

Permit Support Monitoring

TCEQ or the regulated community may identify specific areas where additional information on water quality is needed for the permitting process. Data objectives will be determined by the project, but common objectives include:

- Studies to develop site-specific criteria

- Receiving water assessments
- Characterization of flow conditions

Permit support monitoring must be planned with the appropriate TCEQ staff through the TCEQ CRP project manager to ensure the most beneficial data are collected appropriately. Since these efforts are generally of short, intense duration, TCEQ has attempted to separate these efforts from routine and systematic monitoring. Due to the typically limited duration of this monitoring, it is recommended that a comment is included on the CMS denoting it as permit support monitoring.

Use the guidance for measuring flows to support permit development (location, frequency, and method), found in the “Flow” section of Chapter 3, “Field Measurements,” in the TCEQ *Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods* (RG-415). In addition to the standard electronic data submittal to Surface Water Quality Monitoring Information System described in Task 4, the flow cross section information must be provided using the [Streamflow \(Discharge\) Measurement form](#)¹⁹ also found in Chapter 3 of the *Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods* (RG-415) or in another similar format. Field measurement data may also be collected during each flow survey and submitted electronically in the Event and Result format outlined in Task 4.

19. www.tceq.texas.gov/downloads/water-quality/monitoring/forms/20117.pdf

Special Studies in Priority Watersheds

Basin Steering Committee priorities and TCEQ needs may be addressed through intensive data collection efforts to better characterize water quality and identify and evaluate water quality issues, such as loading contributions from nonpoint sources in the watershed and problems identified through data analyses. Typically, special study monitoring involves the development of a plan that is designed to address a specific objective and is not used to generally screen a water body. Monitoring may be conducted at historical sites that are representative of the affected portion of the water body where previous sampling initially identified an impact or concern.

Additional sites may be needed to establish the geographic extent of the issue.

Planning agencies should review available reports and data before submitting a special study proposal that will outline how they can address the issue(s). Special studies must be planned with the appropriate TCEQ staff through the TCEQ CRP project manager, as specified in Task 2, to ensure the most beneficial data are collected appropriately. The project manager will work with each planning agency to plan studies that meet its current resources and capabilities. Status reports describing activities related to special studies will be submitted with each quarterly progress report as either an attachment, or as part of the quarterly progress report. Most special studies will result in a final report that summarizes and concludes the activities. See Exhibit 3A for special study report components. To simplify this process, these sampling efforts should be set apart by developing them as a QAPP appendix (as described in Task 2) that can be independently revised.

Special Studies Mapping

The planning agency and TCEQ CRP project manager may coordinate a special study to examine and map the types of environmental factors which may influence water quality. These studies will be specified in the work plan and will require the execution of a QAPP Appendix which details the water quality issues under study in the watershed, and the study design for examining those issues. Spatial data which is acquired from third party resources requires advance consideration of quality needs, documentation that the source meets the expected needs, and how data will be handled to prevent inadvertent data loss or degradation.

Spatial data which are collected through the project must document collection procedures, staff qualifications, the quality expectations for field measurements, data handling procedures, and other details to ensure the data are of adequate quality to analyze the variables of interest. The output of these projects may be maps, database tables, or geographic information system (GIS) layers, with appropriate corresponding metadata layers, for the special study watershed. In addition, the QAPP appendix may include any data analysis techniques which will be utilized to inform a discussion of the factors in the watershed which correlate with water quality data.

Continuous Monitoring

Basin monitoring programs have traditionally been implemented by visiting a site and taking grab samples to characterize water quality. This type of monitoring gives you a snapshot of the conditions at that point in time but does not provide information about the variability that may be of interest to some water quality program managers. In situ analyzers characterize water quality in greater detail than is possible with grab samples or short-term deployments of monitoring instruments. This type of continuous monitoring has generically been referred to as “real-time monitoring” since it is possible to access the data from a remote location as the instrument is collecting them.

Continuous monitoring can potentially be used for a variety of purposes, with objectives including:

- Identifying seasonal water quality trends and daily variation.
- Evaluating the influence of point and nonpoint sources of pollution, including short-term events.
- Assessing effectiveness of watershed management and implementation plans.
- Providing current data to the public.

Improved instrumentation and communication systems are making continuous monitoring more feasible. Although the up-front costs in establishing a continuous monitoring strategy are considerably more than the traditional monitoring strategies, the expense may be justified by the monitoring objectives. Opportunities to partner with other agencies, including TCEQ, has allowed continuous monitoring to be more economically feasible for those wanting to establish these programs.

Parameters Monitored

Field Parameters

Parameters measured in the field are used to detect and describe spatial and temporal changes, determine impacts of point and nonpoint sources, develop water quality standards, and assess compliance with water quality standards. Dissolved oxygen (DO), water temperature, total dissolved solids (often evaluated with specific conductance), and pH are field measurements for which water quality criteria are established for each classified water body. The measurement of flow at stream sites is also crucial in assessing water quality, evaluating the attainable use, and in developing site-specific DO criteria. Samples for most parameters collected on perennial streams at flow conditions less than 7Q2 (seven-day, two-year low-flow) cannot be used for assessment purposes; however, low-flow sampling results can contribute to the understanding of water quality changes during critical periods or drought conditions and aid in long-term water resource planning.

Many chemical and biological processes in the aquatic environment are affected by the levels of each of these field parameters. Evaluation of field measurements also provides complementary information necessary in evaluating chemical and biological data. Refer to Chapter 6 of the DMRG for commonly monitored field parameters.

Like continuous monitoring, measuring the variability of short-term conditions over a 24 or 48-hour period will provide more information than an instantaneous measurement. The objective for diel data is to collect and report surface water quality data that are representative of the diurnal variation in field parameters, such as, pH, temperature, dissolved oxygen, and specific conductance for comparison against the water quality standard. Water bodies identified with aquatic life concerns based on instantaneous DO measurements should be considered for 24-hour DO monitoring.

Conventional Parameters

Water samples collected and sent to a qualified lab for analysis are also an important part of the water quality monitoring program. The analysis of nutrients in water samples is needed to help characterize the ambient levels and to determine whether the water body exhibits a potential for generating excessive plant growth which, in turn, can lead to eutrophication and problems with dissolved oxygen. These data also support TCEQ's efforts to develop numeric nutrient criteria for the state's surface waters. Some key nutrient parameters are total nitrogen, total Kjeldahl nitrogen, nitrite + nitrate-nitrogen, ammonia-nitrogen, and total phosphorus. In addition, chlorophyll-*a* may be analyzed to determine the level of algal phyto-pigments as an indicator of algal biomass in the water column and is very important in the assessment of reservoir health. Chloride, sulfate, and total dissolved solids are analyzed to determine density stratification, document amounts and dispersion of pollutants, and evaluate the mixing of fresh and salt water in estuaries. Refer to Chapter 6 of the DMRG for commonly monitored field parameters.

Toxic Substances

Specific toxic substances, pollutants regulated by 30 TAC Section 307.6, Texas Surface Water Quality Standards (TSWQS), should be monitored in water, sediment, and fish tissue at selected sites where impact to water quality is likely. After an impact has been identified, monitoring efforts should move upstream to focus on identifying sources of concern for each sub-watershed (point and nonpoint sources). Refer to Chapter 6 of the DMRG for commonly monitored parameters.

Metals and Organics in Water: Monitoring metals and organics in water should initially focus on those sub-watersheds where concentrations of point and nonpoint source pollutants might be anticipated. A complete scan of point source-related pollutants may be cost-prohibitive and is not generally recommended. The analysis of individual pollutants should be determined based

on comprehensive watershed inventories, identification of water quality problems and their sources, and on past data analyses.

Metals and Organics in Sediment: Monitoring total metals in sediment should initially focus on those sub-watersheds where the pollutants might be anticipated. In addition, conventional parameters in sediment can also be analyzed to provide valuable information. The results of sediment analyses are used to evaluate the condition of the benthic macroinvertebrate habitat, to determine point and nonpoint source impacts, and to monitor rates of recovery following establishment of pollution controls or improved wastewater treatment.

Fish Tissue: Fish tissue sampling to assess human health risk should only be conducted if tissue contamination is probable. Sampling should be designed and conducted cooperatively with the Department of State Health Services since these surveys require substantial resources. For example, fish tissue should be collected where instream concentrations of a toxic compound, known to bioaccumulate, have been found at levels above the human health criteria. Fish tissue samples for purposes other than to assess human health risks are outlined in TCEQ's [Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods](#)²⁰ (RG-415). Surveys to assess risk to aquatic life (e.g., fish) can also be done cooperatively with the Texas Parks and Wildlife Department.

Bacterial Measurements

Two forms of bacteria are analyzed in water samples to determine support of the contact recreation use: *Escherichia coli* (*E. coli*) in freshwater, and Enterococci in tidal water and designated high saline inland waters. TCEQ can assist the planning agency in determining which indicator bacteria need to be analyzed. Refer to Chapter 6 of the DMRG for commonly monitored bacterial parameters.

Biological or Habitat Assessments

The health of aquatic systems can also be assessed by evaluating the biological community present. Along with physical habitat information, fish and benthic macroinvertebrates are collected and identified in a manner that permits an assessment of the composition and integrity of the aquatic community. Biological communities are useful in assessing water quality for a variety of reasons, including their sensitivities to low-level disturbances and their function as continuous monitors. Common objectives for biological monitoring include:

- Collecting data useful for assessing, verifying, and determining appropriate aquatic life uses.
- Inventorying fish and benthic macroinvertebrate communities.
- Collecting data to be used for community structure trend analysis.

20. www.tceq.texas.gov/downloads/publications/rg/swqm-procedures-volume-1.pdf

- Correlating measures of chemical water quality to biological information, where possible.
- Assessing the effects of episodic spills and dumping of pollutants, wastewater treatment plant malfunctions, toxic nonpoint source pollution, or other impacts that periodic chemical sampling is unlikely to detect.
- Assessing the effects of perturbations of the physical habitat such as sedimentation from stormwater runoff, dredging, or channelization.
- Monitoring rates of recovery following implementation of improved wastewater treatment.
- Providing early warning of potential impacts.

Methods outlined in TCEQ's [Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data](#)²¹ (RG-416) are recommended for fish, benthic macroinvertebrate, and habitat sampling in freshwater, wadable streams.

Methodologies for assessing tidal streams, reservoirs, and estuaries have not been developed. One monitoring approach for evaluating the biological community involves the determination of a "reference" condition that is representative of the watershed in a healthy, non-impacted condition from which to compare other sites within the watershed. Locations where conditions differ significantly from reference conditions may be impacted by pollution and should be the focus of further investigation or possible remedial action. The selection of a reference site should be done in consultation with TCEQ staff. When possible, the evaluation of habitat, fish, or benthic macroinvertebrate integrity should be used in conjunction with physical and chemical data to provide an integrated assessment of support of the aquatic life use for water bodies identified in the [Texas Surface Water Quality Standards \(TSWQS\)](#).²²

All biological and habitat data reported to TCEQ under the approved QAPP should also be summarized and submitted electronically as outlined in Task 4. Some biological and habitat monitoring (e.g., Receiving Water Assessment) may require submittal of a report, requirements of which are summarized in Exhibit 4D, BLOB File Guidance and Examples. The number of events necessary to meet the objectives for the different types of biological monitoring (e.g., Aquatic Life Monitoring, Use Attainability Analysis, Receiving Water Assessment) should be coordinated with the appropriate TCEQ staff.

Ambient Toxicity

Ambient toxicity is another effective means of determining whether any substances in the water are affecting the reproduction and survivability of fish and benthic macroinvertebrates that typically inhabit those waters. Sites should be selected based on the following criteria:

- Known or suspected toxicity, suggested by supporting information.

21. www.tceq.texas.gov/downloads/publications/rg/swqm-procedures-manual-volume-2-rg-416.pdf

22. www.tceq.texas.gov/waterquality/standards/eq_swqs.html/

- Integration of toxicity sampling with other biological or chemical testing at a contaminated site.
- Importance of the water body uses that may be impaired.

Basin Monitoring Planning, Coordination, and Development

Developing a comprehensive basin monitoring program that supports the various basin and statewide objectives requires intensive planning and coordination. The monitoring programs necessitate annual review and evaluation to address new cooperative efforts and emerging priorities and to ensure that monitoring programs remain effective and viable.

The intent, purpose, and protocols for each type of monitoring described in this task serve to support the decision about which type of monitoring to use and where to use it. A major objective of monitoring under the Clean Rivers Program is to provide data to support the assessment of surface water quality, water quality standards, and wastewater permits; therefore, monitoring decisions should be made considering the minimum requirements needed to support these objectives. These objectives are outlined in the most recent version of TCEQ's [Guidance for Assessing and Reporting Surface Water Quality in Texas](#).²³

Coordinated Monitoring Process

Each spring, monitoring organizations meet to develop a CMS to be implemented in the coming fiscal year. The goal of this activity is to provide a process by which the planning agencies will coordinate their monitoring activities with TCEQ and other basin monitoring organizations collecting data under a TCEQ approved QAPP. By participating in this activity, planning agencies will fulfill the contract provision requiring that monitoring programs be planned in consultation with TCEQ, as it relates to routine monitoring. Participation also ensures that monitoring resources for the basin will be more efficiently used.

Participation in Coordinated Monitoring Meetings

Organizations that have been identified as willing to comply with TCEQ requirements for collecting quality-assured water quality data should be invited to participate in coordinated monitoring meetings. Where possible, invite other local monitoring entities (e.g., Texas Parks and Wildlife, United States Geological Survey, Texas State Soil and Water Conservation Board) to participate. Depending on the type of monitoring (e.g., routine, seasonal, stormwater), the information included in the schedule will need to follow the monitoring type code definitions to

23. www.tceq.texas.gov/downloads/water-quality/assessment/integrated-report-2022/2022-guidance.pdf

ensure the data quality objectives are conveyed to the eventual data user. The monitoring type codes can be found in Chapter 4 of TCEQ's [Data Management Reference Guide](#)²⁴ (DMRG).

Preparation for Coordinated Monitoring Meetings

In preparation for meetings, the planning agency should seek input from the Basin Steering Committee or technical subcommittee about stakeholder monitoring issues or concerns to be addressed. Critical dates for monitoring meetings and associated deliverables are in the work plan shell. The last possible date for the coordinated monitoring meeting should be indicated in the final work plan. Before finalizing the date of the meeting, the planning agency should get agreement on the date from representatives from each organization.

Prior to the meeting, the current fiscal year's schedule will be used to populate the upcoming planning fiscal year's database on the [statewide CMS](#).²⁵ TCEQ will post reference materials on the [Coordinated Monitoring webpage](#)²⁶ that will provide guidance on monitoring priorities and preparing for the monitoring meeting. To ensure an effective meeting and the participation of all appropriate parties, the following steps should be taken prior to the meeting:

Prior to attending a coordinated monitoring meeting, use the current TCEQ reference materials and monitoring objectives for the basin when developing a draft monitoring schedule for the upcoming state fiscal year.

Sites should be selected to meet the objective of the monitoring. If the objective is the assessment of overall water quality, then the site should be representative of that water body. Please see the TCEQ [Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods](#)²⁷ (RG-415) for information on selecting a representative site.

List the frequency of sampling for each parameter set. Provide a list of what will be included in each parameter set monitored.

Distribute the draft monitoring schedule to the participants before the meeting (e.g., distribute at least one week prior to meeting). The draft monitoring schedule for each basin could use the statewide schedule on the web as a template and be sorted by segment. It is recommended that proposed changes to the schedule be included before the meeting as well.

Create maps (e.g., electronic maps) of a suitable scale that clearly identify each sampling site on the proposed CMS. Be sure to include and label major roads, cities, county lines, water bodies, outfalls, and agricultural areas.

24. www.tceq.texas.gov/waterquality/data-management/dmrg_index.html

25. cms.lcra.org/

26. www.tceq.texas.gov/waterquality/monitoring/coop_monitoring.html

27. www.tceq.texas.gov/downloads/publications/rg/swqm-procedures-volume-1.pdf

Conducting a Coordinated Monitoring Meeting

Monitoring will be discussed segment by segment, and station by station in these working meetings. 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. It is important to begin documenting information about why sites are being monitored (e.g., site was added for best management practice (BMP) effectiveness monitoring; site is a long-term trend site; site is a TCEQ least disturbed reference stream). This documentation can be added to the CMS “Comments” field or in a separate summary document about the stations in each basin. The designated CMS data manager (LCRA) logs into SWQMIS and generates a station inventory report. This is used to update the CMS. In addition, TCEQ will provide the segment layers to the designated CMS data manager to update the CMS. Follow-up on Coordinated Monitoring Meetings

As a follow-up to each coordinated monitoring meeting, a “Summary of Changes” will be produced by the planning agency that reflects the meeting’s discussions and outcomes. The Summary of Changes deliverable is due within two weeks after the meeting. The summary should reflect what decisions were made: why a site was dropped or added, why the frequency was altered, why a parameter was dropped or added, why a monitoring need was unable to be addressed, and what are the future monitoring recommendations. This information will also be used in the QAPP Appendix B to help explain the sample design rationale, as well as the justification of changes during the schedule updates. You can find an example “Summary of Changes” in Exhibit 3B.

Many factors may influence monitoring decisions after a coordinated monitoring meeting has been attended (e.g., stakeholder or TCEQ issues need to be addressed, monitoring resources needed in another basin). Participants in the CMS process should continue to communicate schedule changes until the schedule is finalized, as well as throughout the year.

Maintaining the Monitoring Schedule

The monitoring schedule for the planning agency will be maintained on the statewide CMS. A link to this website should be readily accessible from the planning agency’s CRP webpage. All CMSs need to be “finalized” by May 31. Changes to the monitoring schedule should also be provided to the Steering Committee. Updates that occur during the year should be described in the quarterly progress report.

All CRP monitoring should be included in the CMS, but partners may decide to include additional monitoring projects occurring in the basin. Examples of non-CRP projects that may be incorporated into the CMS include monitoring associated with watershed characterizations, watershed protection plans, Total Maximum Daily Load and implementation plans, etc. It is recommended the following conditions be met for non-CRP or SWQM monitoring to be included: a project representative participates in the basin’s Coordinated Monitoring Meeting

and the project has a documented process to fulfill the data quality objectives associated with regulatory decision making. It is required that all non-CRP or SWQM monitoring contain a project duration in the comments field of the CMS. While updating the CMS after the meeting, it is also important to remove any monitoring that is no longer being conducted (this is why utilizing the comments field is important).

Since CRP partners, TCEQ Regional Offices, and TCEQ program areas have password access to update the statewide schedule at any time, all parties identified in the schedule should coordinate and communicate monitoring changes with each other on an on-going basis. Changes to the QAPP may impact the statewide schedule. After a QAPP amendment or appendix has been approved, the information should be reflected on the statewide schedule, and email notification sent to the TCEQ CRP project manager and other affected parties (e.g., TCEQ Regional Offices). Updates should also be provided in the quarterly progress report. Only the portion of the CMS which has been changed should be reported to the project manager in the quarterly progress report.

For additional information on the CMS please see the “Instructions for Completing the Coordinated Monitoring Schedule” on the [Coordinated Monitoring webpage](#).²⁸

28. www.tceq.texas.gov/waterquality/monitoring/coop_monitoring.html



Exhibit 3A. Special Study Report Components

Instructions: Most special studies will result in a final report that summarizes and concludes the activities. Exhibit 3A provides the special study report components.

Title: Represents the report's content.

(Note: Titles should be clear, specific, and informative.)

Table of contents: Provide an easy-to-follow guide of what the report has to offer. Add what is necessary so your audience can understand what is included in the report: list of abbreviations, list of tables, list of figures.

Executive summary: Informative digest of the significant content and conclusions of the report. It is meant to be intelligible by itself, summarizing the purpose, findings, conclusions, and recommendations.

(Note: This is the minimum that should be included on the website when a report is too large or includes graphs and figures that cannot be posted.)

Introduction: States the objective(s) of the report.

(Note: When the QAPP amendment was designed, the data quality objective(s) and the study design have already addressed this.)

Project significance and background: Why did you decide to do this project?

Methods and materials: Include enough detail that would allow someone to evaluate what was done or even duplicate if necessary (e.g., discuss experimental design).

Results and observations: Present the results that logically support (or provides data against) the objective stated in the introduction. Conclusions drawn from numerical data should be supported by brief explanations of the statistical criteria applied.

Discussion: Interpret the data presented in the "Results and Observations" section, especially regarding the objective given in the introduction. Include discussion of previous findings that support and do not support your findings.

Summary: State the conclusions that can be drawn from your data considering all the factors you presented in your "Discussion" section. State the logical implications of your findings for future application and study. What did you learn and what are the implications? What are the recommendations based on your findings? Was the objective accepted or rejected?

References: Give credit where credit is due. If you reference or paraphrase other work, give the reference of the source document. If you researched lots of documents, but

did not specifically reference them in your report, you may consider a *bibliography* since this will allow others more information if they are interested.

Appendices: Include as necessary to clarify or supplement the text. This could include the raw data or a survey used to gather data.

References:

(Note: These are examples of references and formatting. Include references of any source documents used in the report.)

CBE Style Manual Committee. CBE Style Manual: A Guide for Authors, Editors, and Publishers in the Biological Sciences. 5th ed. rev. and expanded. Chicago, IL: Council of Biology Editors, Inc.; 1983.

Brusaw, C.T., G.J. Alred, and W.E. Oliu. Handbook of technical writing. 12th ed. New York, NY: St. Martin's Press. 2020.



Exhibit 3B. Coordinated Monitoring Meeting

Summary of Changes Example

Instructions: As a follow-up to each coordinated monitoring meeting, a “Summary of Changes” will be produced by the planning agency that reflects the meeting’s discussions and outcomes. The summary should reflect what decisions were made: why a site was dropped or added, why the frequency was altered, why a parameter was dropped or added, why a monitoring need was unable to be addressed, and what are the future monitoring recommendations. Use this example as a template when developing a “Summary of Changes.”

Coordinated Monitoring Meeting: April 9, 2022 Summary of Changes

The following changes, additions, or deletions have been made to the FY2022 Coordinated Monitoring Schedule to address monitoring issues identified by the involved monitoring entities or steering committee members. The **bolded** text represents an addition. The *italic and bracketed* text represents removals.

1. The [*Wet River at the Industrial site will be discontinued*] at the present location and a **new site that is downstream and out of the mixing zone** of the Industrial discharges will be found for 2023.
2. A new site on Peachy Creek **will be added bimonthly in 2023** (Station ID 17935, Peachy Creek at Farm to Market Road (FM) 397). Data at this site was collected during the Peachy Creek TMDL. The site will be monitored in 2023 and beyond to identify any changes in the water quality that may be a result of the implementation of BMPs in the watershed.
3. [*Weekly monitoring of E. coli will no longer be funded by CRP*]. TCEQ has sufficient data for assessment purposes and does not need the bacterial data at this frequency any longer. The planning agency will evaluate their ability to continue monitoring at these sites for their own use and use by their constituents.
4. Region 13 **will add a quarterly monitoring location in City Park on the Wet River** (Station ID to be determined).
5. Samples for *E. coli* **will be sampled every Saturday for eight weeks**, beginning in mid-May and ending in July 2023, for screening of bacterial concentrations during peak recreational use on the **Green and Wet Rivers**.
6. Example Creek, Segment 1806Z, is impaired for dissolved oxygen. Biological and 24-hour dissolved oxygen information needs to be collected at this site. Neither the CRP partner nor the Regional office could pick up this monitoring with available resources.
7. Organics in sediment, specifically those organics associated with urban environments (e.g., total petroleum hydrocarbons) have been identified by the Steering Committee as a concern and will be added as a special study later.

Task 4: Data Management

In This Task

| | |
|---|-----|
| About Task 4 | 143 |
| Data Management Roles..... | 143 |
| Data Management for the Basin Planning Agency | 143 |
| TCEQ Data Management..... | 143 |
| TCEQ CRP Project Manager Role | 143 |
| TCEQ Data Manager Role..... | 144 |
| Preparing and Reporting Data | 144 |
| Formatting Data | 144 |
| Coding Data..... | 145 |
| Biological Electronic Data Reporting..... | 145 |
| Binary Large Object (BLOB) Files..... | 146 |
| Composite Samples..... | 147 |
| Data Review and Validation | 148 |
| Data Review Checklist..... | 148 |
| Validating Outliers | 149 |
| SWQMIS Validations | 149 |
| Submitting Data to TCEQ | 150 |
| Other Data Management Considerations | 152 |
| Creating New Sampling Stations and New Codes..... | 152 |
| Data Correction Requests | 153 |
| Data Resubmittals..... | 153 |
| Data on Basin Planning Agency Webpages..... | 154 |
| Distribution of Provisional Data | 154 |
| CRP Data Management Training..... | 154 |
| Exhibit 4A. Data Review Checklist..... | 155 |
| Exhibit 4B. Example Data Summary | 158 |
| Exhibit 4C. Understanding Biological Event Data Tagging | 162 |
| Exhibit 4D. Binary Large Object (BLOB) File Guidance and Examples | 167 |
| Exhibit 4E. SWQMIS Validations | 176 |
| Exhibit 4F. Data Submittal Progress Report | 178 |
| Template for the Data Submittal Progress Report | 179 |

About Task 4

This task involves the preparation of water quality monitoring data to ensure data quality and compatibility with TCEQ requirements.

Data Management Roles

Data Management for the Basin Planning Agency

The planning agency's data manager is responsible for preparing data sets of quality-assured data under the [DMRG](#).²⁹ Each data set submitted to TCEQ should contain data collected under a **single** QAPP.

The planning agency data manager will review each data set using the data review checklist (see Exhibit 4A for an example) and will prepare a data summary (see Exhibit 4B for an example) to be submitted with each data set. The summary will contain basic identifying information about the data set, information regarding inconsistencies and errors identified during data verification and validation steps, or problems with data collection efforts including data loss during sample collection or sample analysis. The planning agency will submit data to the TCEQ CRP project manager as a data package containing at least the Data Loading Validator Report generated from the SWQMIS user test environment, the data text files, and the data summary (see Exhibit 4B for an example).

TCEQ Data Management

TCEQ CRP Project Manager Role

The TCEQ CRP project manager is responsible for receiving and reviewing data submitted by planning agencies to ensure consistency and conformance with QAPP specifications and contract requirements. The project manager reviews documents contained in the data package submitted by the planning agency. The project manager will conduct checks for data coding and reported values. Parameter codes and stations will be cross-referenced against the specifications as outlined in the QAPP.

The SWQMIS Data Loading Validator Report from the user test environment will be compared to the appropriate QAPP, the data summary, and the Monitoring Activities section of the quarterly progress report (see Exhibit 1D for a progress report template) to reconcile expected versus reported results. One step in this review is assessing whether the required Limits of Quantitation (LOQ's) listed in the QAPP correspond to the minimum, or "less than", values submitted in the data set. When discrepancies

29. www.tceq.texas.gov/waterquality/data-management/dmrg_index.html

exist without adequate explanation in the data summary, the TCEQ CRP project manager will ask the planning agency to reconcile the differences and make corrections as necessary. The planning agency and the TCEQ CRP project manager will ensure that changes to data sets are consistent with QAPP requirements. Deficiencies found during the data review may invalidate the reported data and may require a corrective action. When all errors and discrepancies have been reconciled, the revised dataset will be forwarded to and reviewed by the TCEQ data manager.

TCEQ Data Manager Role

The TCEQ data manager is responsible for receiving data sets from the TCEQ CRP project manager, and tracking actions taken on each data set. The data manager ensures that data are reported following instructions in the latest version of the DMRG. The TCEQ data manager will run the SWQMIS Loader Verification Utility in the Production Environment of SWQMIS (SWQMIS PROD) and, if no errors are identified, will send the Data Loading Validator Report to the TCEQ CRP project manager for approval. If errors are found, the data manager will notify the project manager who will then communicate with the planning agency to resolve these errors.

After the data manager receives approval from the project manager, the dataset is then ready for loading into SWQMIS PROD.

The data manager also addresses requests for new codes, new monitoring stations, or corrections to existing data.

Preparing and Reporting Data

Formatting Data

To prepare data for upload into SWQMIS, two text files must be created. The text files, called the 'Events File' and the 'Results File,' are formatted using data dictionaries. See Chapters 7 and 8 of the DMRG for more information on data dictionaries, data deliverables, generic sample and events file structure, and generic results file structure.

The text files are related by a unique identification number, the Tag ID. A Tag ID is assigned to each sampling event. The 'Events File' contains each reported sampling event, associated with a unique date, time and place (depth and station). The 'Results File' contains each measurement that was collected and analyzed for that event; this leads to a "one-to-many" relationship between the event and results files where many results are reported for one event.

When formatting the two files, the vertical bar is used to delimit the fields. This vertical bar is called a "pipe", and so the text files are commonly known as "pipe-delimited" text files. The pipe key is typically found below the "backspace" key, on the right side of the keyboard. It is important to use the "pipe" because other commonly used delimiters, such as commas and slashes, may be used in other fields or may cause a problem when loading the fields into a database. Punctuation and hard returns are strongly discouraged as they can cause problems when exporting or aggregating data. The text files should only contain the data.

Planning agencies should omit header rows as these are problematic for the SWQMIS loader program.

Coding Data

(Tag ID, Tag Prefix, Submitting Entity, Collecting Entity, and Monitoring Type)

The Tag ID is a unique alphanumeric identifier assigned to each sampling event; this Tag ID links the event to the measurement values recorded in the Results file, in a one-to-many relationship. The tag prefix is the unique one or two-letter code added to the beginning of the Tag ID which identifies the planning agency that is reporting the data set. A list of valid tag prefixes can be found in Chapter 5 of the DMRG.

Submitting Entity codes identify the agency listed in the QAPP as the entity responsible for submitting the data to TCEQ. Collecting Entity codes identify the organization responsible for collecting the data. Lists of valid submitting and collecting entity codes can be found in Chapter 4 of the DMRG.

Monitoring type codes identify the type of monitoring under which the reported data was collected. A list of valid monitoring type codes can be found in Chapter 13 of the DMRG.

Example:

SR|LW|RT means the data was submitted under the Sabine River Authority (SR) QAPP and collected by the City of Longview (LW) without targeting any certain environmental conditions (RT). The RT monitoring type code identifies that this data was collected during routine monitoring. The tag prefix would be "J" which is assigned to the Sabine River Authority.

Biological Electronic Data Reporting

There is no difference in format between biological data flat files and routine surface water quality monitoring data flat files. Partners and contracted monitoring entities must report biological data via pipe-delimited flat files.

A separate Tag ID should be assigned for each type of data collected during a biological sampling event. SWQMIS uses the Sample Event and Sample Set structure. This structure is a one-to-many relationship with one Sample Event (the entire biological monitoring event) containing multiple Sample Sets. Some sets are biological (Nekton Electrofishing, Nekton Seining, etc.) and some are non-biological (24-hour data and routine chemistry), but all are included in the Sample Event.

Each biological Sample Set must include the Parameter Code 89888 which identifies that set as containing biological data. The value selected for Parameter Code 89888 will be determined by the Sampling Category (see Table 12.1 in [Chapter 12](#)³⁰ of the DMRG). To see how parameters are grouped under each sampling category, refer to Table 12 in [Chapter 6](#)³¹ of the DMRG for commonly used parameter codes for biological data. Biological data should be reported according to TCEQ's *Surface Water Quality Monitoring Procedures, Volume 2 for Collecting and Analyzing Biological Assemblage and Habitat Data*.

Binary Large Object (BLOB) Files

Reporting biological monitoring data also requires attaching BLOB files to the SWQMIS Sample Events or Sample Sets. BLOB files must be named in a format that includes the station ID, water body name, sample end date, and type of file (e.g., 13486-GreensCreek-24May2013-HabitatTransectWorksheets). BLOB files are attached at the sample event and sample set levels in SWQMIS by authorized TCEQ staff.

Typical BLOB file types for each SWQMIS Sample Event for biological data include:

- An Aquatic Life Monitoring checklist. The ALM checklist and site map can be combined into a single BLOB if needed to stay within the five file maximum attachments per Event or per Sample Set.
- Site map(s). A site map of the sampling area of sufficient scale to annotate both the sampling reach where collection occurred, and location of habitat transect lines.
- Nekton voucher photos (unless actual voucher specimens are retained). All voucher photos should be combined into one document regardless of the method used to sample. Each photo should be labeled with station short description, station ID, species name, and collection date.
- Habitat transect worksheet (e.g., Stream Physical Characteristics Worksheet with the transect data). The worksheet should be filled out clearly and completely. If

30. www.tceq.texas.gov/downloads/water-quality/data-management/reference-guide/dmrg-ch12.pdf

31. www.tceq.texas.gov/downloads/water-quality/data-management/reference-guide/dmrg-ch6.pdf

not using the Habitat Transect Worksheet provided in the SWQM procedures, it should contain the same information.

- Habitat transect photos. All habitat photos should be combined into one document. Photos should indicate the direction in which the photo was taken (i.e., left bank, right bank, upstream, downstream). Each photo should be labeled with station short description, station ID, and collection date.
- Any other additional file as discussed between the planning agency and the TCEQ CRP project manager and specified in the QA document.

For individual SWQMIS Sample Sets (Tag ID) there can be more than one attachment. All photographs for one SWQMIS Sample Set (Tag ID) should be combined into one document that includes descriptive information for each individual photograph (preferably a .pdf, but a Word document, or Power Point file will suffice).

Electronic data should include a README.txt file that includes a list of each BLOB file, a description for each BLOB file, and a designated place for the BLOB file to be attached (either the SWQMIS Sample Event ID, or specific Tag ID).

Please reference Chapter 12 of the DMRG or Exhibit 4D for additional information regarding required files for biological data submissions, event file and results file format, and README file format. An explanation of how biological data is tagged can be found in Exhibit 4C.

TCEQ CRP project managers will accept BLOB files in an electronic format, which is the preferred deliverable format.

Composite Samples

Composite samples require entries in several additional fields in the Events file. These fields are Start Date, Start Time, Start Depth, Category, and Type.

Category must be one of four codes: T for time composites, S for space composites, B for both space and time composites, or F for flow-weighted composites.

The Type field must be a two-digit number (including leading zeros, if necessary) indicating the number of grabs, CN for continuous, or GB when the number of grabs is unknown.

More information about how to describe composite samples can be found in the DMRG or in discussion with your TCEQ CRP project manager.

Data Review and Validation

Data review and validation combines the data validation and verification requirements defined in Task 2 with those outlined in this task. The major considerations for this process are evaluating data reasonableness and verifying that quality performance specification limits were met. Data that do not conform to the specifications of the QAPP will not be submitted to TCEQ unless a data resubmittal is allowed as described below and in [Chapter 8 of the DMRG](#)³². Each anomaly that causes a data point to not meet QAPP specifications will be described in the Data Summary (see Exhibit 4B for an example).

Data Review Checklist

The data review checklist (Exhibit 4A) covers three main types of review: data format and structure, data quality review, and documentation review.

The Data Format and Structure section includes checks for required entries and formats. This section can be automated by developing a computer program that checks the database for outliers, other data anomalies, and some types of data transcription errors. These checks should address questions such as:

- Are there any duplicate Tag ID numbers and are tag prefixes correct?
- Do the sampling dates in the Results file match those in the Events file for each Tag ID?
- Are the codes for Submitting Entity, Collecting Entity, and Monitoring Type consistent with the entity and type of monitoring conducted?
- Are the sampling dates and times in the correct format with leading zeros (MM/DD/YYYY) and (HH:MM)?

See the data review checklist, Exhibit 4A, for a complete list.

The Data Quality Review section includes checks specific to the acceptability of the data. This requires a more in-depth review of the data by personnel that understand the results of the laboratory analyses and field measurements. This section includes checks that should address questions such as:

- Are the required reporting limits consistent with those in the QAPP?
- Have outliers been confirmed and a code entered into the Verify_flg field?
- Do the field and laboratory results appear reasonable and acceptable when compared to other corollary data or historical measurements?
- Are all sampling sites defined in the QAPP?

32. www.tceq.texas.gov/downloads/water-quality/data-management/reference-guide/dmrg-ch8.pdf

- Are all parameter codes listed in the QAPP?

See the data review checklist, Exhibit 4A, for a complete list.

The Documentation Review section includes checks of the quality control information that is developed and provided by the laboratory or field staff.

This section includes checks that address questions such as:

- Are blank results acceptable as specified in the QAPP?
- Were control charts used to determine the acceptability of field duplicates?
- Were there any failures in field and laboratory measurement systems that were not resolvable and resulted in unreportable data?
- Have any anomalies been reported in the data summary?
- Was the laboratory's NELAP Accreditation current for the analysis conducted?

These are questions that must be evaluated and answered for each dataset submitted, rather than simply checking a box without verifying the true answer. These questions are part of the quality assurance system and are open to review during a quality systems audit.

Validating Outliers

TCEQ establishes a minimum and maximum value for many parameters above or below which a value is considered an “outlier.” The min and max values represent a statistically derived range based on historical data (e.g., first and 99th percentile) except for in cases where the parameter is reported as either absent or present. Reported values that are found to be outliers should be checked against field and laboratory records to verify the correctness of the value as described in Task 2. The planning agency data manager should ensure that these outliers are flagged in the data set to show that they have been confirmed. If an outlier is not flagged, the SWQMIS data loader will find the anomaly and will not accept the data. All outliers must be flagged in the Results file by the inclusion of a “1” in the Verify_flg field.

A file containing all parameters and their min and max levels for outlier values in SWQMIS is available upon request.

SWQMIS Validations

Planning agencies load datasets into the test environment of SWQMIS to ensure that data is formatted correctly and meets data reporting requirements as described in the

DMRG and Table 3.1 of TCEQ's [Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods](#).³³

The SWQMIS Validator Report provides a list of errors in the data set relating to duplicate Tag IDs and records, data structure, outliers, significant figures, and rounding for certain parameters. Some errors can be over-written by the system and will not require a correction to the data files, while others are not. A full list of validations performed in SWQMIS is in Exhibit 4E.

Once the data is free of errors, the planning agency data manager will run the SWQMIS Loader Verification Utility in the Test Environment of SWQMIS to produce a report called the **Data Loading Validator Report** that contains the following:

- Date Range.
- Tag ID Range.
- Count of records in the data set.
- Parameter codes submitted with the data set and the number of times each parameter was reported.
- The minimum and maximum values submitted for each parameter code.
- Stations for which data was submitted.
- Number of events at each station.
- Submitting Entity, Collecting Entity, and Monitoring type codes in the data set.
- Outliers in the data set.
- A comparison of data reported against the historical statistics at each station.
- The ten highest and lowest values reported for each parameter.

The report should be reviewed against the Monitoring Activities section of the quarterly progress report (see Exhibit 1D for a progress report template), the QAPP, and the data summary (see Exhibit 4B for a data summary example) to ensure consistency in reported values and site locations.

Submitting Data to TCEQ

Water quality data will be submitted to the TCEQ CRP project manager via email as a deliverable by the due dates specified in the contract. The due dates will also ensure the following:

- Data that was collected under the previous contract established for FY22-23 which were not able to be submitted to TCEQ prior to the end of the contract term will be submitted in within the contract established for FY24-25.

33. www.tceq.texas.gov/downloads/publications/rg/swqm-procedures-volume-1.pdf

- Data collected under the contract established for FY24-25 is submitted throughout the fiscal year and prior to the close of FY24 and prior to the close of the contract in FY25.

For example, the Dec. 1 due date ensures that TCEQ has an updated water quality database through the close of the prior fiscal year and the Aug. 1 due date ensures data is submitted prior to the close of the fiscal year.

Biological data should be submitted to the TCEQ CRP project manager via email as a deliverable by the due dates specified in the contract.

The February 1, 2025 data submittal deliverable is an early submission “call for data” and the March 1, 2025 deliverable is the final “call for data” submission with regards to the Texas Integrated Report (IR). The February 1, 2025 and March 1, 2025 dates will ensure data collected through Nov. 30, 2024 will be submitted to TCEQ for use in the IR and provide time for TCEQ review. Planning agencies should also coordinate with subparticipants to submit data by the February 1, 2025 and March 1, 2025 deadlines, or sooner if feasible, as well. Planning agencies are encouraged to submit data early (e.g., February 1, 2025 or earlier), when feasible, prior to the March 1, 2025 final “call for data” date.

In general, each water quality data deliverable should include data collected during the contract period (Dec. 1, 2023 data deliverable will include data collected during the previous contract) following these guidelines and the due dates contained in Task 1 of this guidance.

- Data Deliverable, contains data that was collected under the previous contract established for FY22-23 which were not able to be submitted to TCEQ prior to the end of the contract term—submit Dec. 1, 2023
- Data Deliverable, contains data collected through Nov. 30, 2023—submit March 1, 2024
- Data Deliverable, contains data through April 30, 2024—submit Aug. 1, 2024
- Data Deliverable, contains data through Aug. 31, 2024—submit Dec. 1, 2024
- Data Deliverable, contains data through Nov. 30, 2024—submit Feb. 1, 2025 (early “call for data” submission) and March 1, 2025 (final “call for data” submission)
- Data Deliverable, contains data through April 30, 2025—submit Aug. 1, 2025 (*data collected from May 1, 2025 through August 31, 2025 will be submitted by Dec. 1, 2025 as a deliverable in a FY26-27 contract. If data collected from May 1, 2025 through July 1, 2025 is ready for submittal during the current contract period, submit Aug. 1, 2025.)

- Data Submittal Progress Report—submitted with quarterly progress reports (due dates specified in Task 1)

In general, biological data deliverables should include data collected during the contract period (Dec. 1, 2023 data deliverable will include data collected under the previous contract established for FY22-23 which were not able to be submitted to TCEQ prior to the end of the contract term) following these guidelines and the due dates contained in Task 1 of this guidance.

- Data Deliverable, contains data that was collected under the previous contract established for FY22-23 which were not able to be submitted to TCEQ prior to the end of the contract term—submit Dec. 1, 2023
- Data Deliverable, contains data collected through Nov. 30, 2024—submit Feb. 1, 2025 (early “call for data” submission) and March 1, 2025 (final “call for data” submission)
- Other Data Deliverables—submit within timeframe(s) agreed upon with TCEQ project manager

Along with the water quality data, the planning agency’s data manager provides the SWQMIS Loading Validator Report (.pdf or .html file) with a data summary (see Exhibit 4B for an example) to the TCEQ CRP project manager. The data summary explains data discrepancies (e.g., missing measurements), describes field and lab issues, and indicates whether the corrective action process has been initiated. Corrective action status reports referencing corrective action plans relating to the missing measurements will be submitted with the progress report after they are finalized. Additionally, when data cannot be submitted due to either sampling complications or QC failures, a running tally of this data should be maintained and reported on the data summary to determine overall percent completeness per data submittal period.

Planning agencies using SWQMIS should ensure their authorized SWQMIS users have logged into SWQMIS and obtained a password. Users should also ensure they log into SWQMIS from time to time so their password will stay active; otherwise, it will take time to request and obtain a new password which could lead to delays. Planning agencies should especially ensure that users log into SWQMIS prior to the Feb. 1 and March 1 call for data dates to prevent data submittal delays.

Other Data Management Considerations

Creating New Sampling Stations and New Codes

Requests for the creation of new monitoring stations will be handled via SWQMIS. Each planning agency has been given access to the Monitoring

Stations Module and the Reports Module of SWQMIS. Specific instructions for requesting new sampling stations are included in Section 4.3 of the [DMRG, Chapter 3](#).³⁴ Additional helpful information for creating new stations or requesting changes to existing stations can be found in Chapter 3 of the DMRG. Planning agencies should be sure to submit requests for new monitoring stations in the Production environment of SWQMIS. Requests for new stations submitted in the Test environment cannot be processed.

Requests for new codes relating to Submitting Entity, Tag Prefix, Collecting Entity, and parameter codes should be coordinated with the TCEQ CRP project manager. The Monitoring type codes have been set for specific data use purposes, and new codes are created only if there is a demonstrable need. Lists of existing codes are available in the DMRG. To request new codes, complete the appropriate [Parameter and Constituent Request form](#).³⁵

Data Correction Requests

If the planning agency finds that water quality monitoring data are in error and have been loaded to SWQMIS Production environment, this fact should be communicated to TCEQ. A Data Correction Request is intended to correct erroneous data that has been uploaded to SWQMIS. If the data has not been loaded to Production, then a Data Correction Form is not required, and the planning agency can revise the dataset and resubmit it. A [SWQM Data Correction Request Form](#)³⁶ should be used to specify the applicable corrections. The forms should be submitted electronically to the TCEQ CRP project manager.

If numerous errors or systematic errors are found which make use of the form unreasonable, contact your TCEQ CRP project manager for alternate electronic reporting methods.

Data correction requests should be submitted to TCEQ as soon as possible after errors are discovered and within an agreed upon timeframe by the TCEQ CRP project manager.

Data Resubmittals

In certain cases, data identified as not conforming to the QAPP may still be submitted for inclusion to SWQMIS via a data resubmittal form. These forms are appropriate only in circumstances where the quality of the data is known and meets the data quality

34. www.tceq.texas.gov/downloads/water-quality/data-management/reference-guide/dmrg-ch3.pdf

35. www.tceq.texas.gov/downloads/water-quality/data-management/parameter-constituent-request.pdf

36. www.tceq.texas.gov/downloads/water-quality/data-management/data-correction-request.pdf

objectives of the project; the data resubmittal form is intended primarily to address minor deviations from the QAPP that otherwise do not negatively impact the acceptability, quality, or assurance of quality of the data. It is incumbent upon the appropriate planning agency personnel to complete the data resubmittal form, detailing the nonconforming data and describing the documentation which demonstrates the acceptability of the data—TCEQ will then evaluate the data resubmittal and associated documentation to determine if the data meet the program data quality objectives. The TCEQ CRP project manager, in consultation with the TCEQ lead QA specialist, will decide on a course of action that addresses the nonconformance. For more information on the data resubmittal process see [Chapter 8 of the DMRG](#).³⁷ Examples of documentation which may be required to accompany a data resubmittal include but are not limited to corrective action forms and QAPP amendments.

Data on Basin Planning Agency Webpages

Public availability of surface water quality data is an important facet of the Clean Rivers Program. The planning agency should make current data accessible to the public and should include data collected by TCEQ, if feasible. A disclaimer should be provided on the website if the complete dataset for the basin is not available. New data should be added to the planning agency webpage at least twice annually. The planning agency may choose to provide a link to the TCEQ water quality data viewer to satisfy this deliverable.

Distribution of Provisional Data

CRP data that have not been fully reviewed and validated by TCEQ may be provided upon request at the planning agency's own discretion. If the planning agency opts to provide provisional data to interested parties a disclaimer must be included stating that the data are provisional. The disclaimer must indicate that the data have not undergone TCEQ review and validation and, therefore, may be subject to revision or exclusion from SWQMIS.

CRP Data Management Training

TCEQ may conduct data management training workshops, as needed, in response to new data management procedures or requirements. These workshops will typically be held in conjunction with other CRP training.

37. www.tceq.texas.gov/downloads/water-quality/data-management/reference-guide/dmrg-ch8.pdf



Exhibit 4A.

Data Review Checklist

Instructions: This checklist (Table 4-1) is to be used by the planning agency and other entities handling the monitoring data to review data before submitting to TCEQ. This table may not contain all the data review tasks being conducted.

Table 4-1. Data Review Checklist

| Data Format and Structure | Yes, No, or NA |
|---|-----------------------|
| Are there any duplicate Tag ID numbers in the Events file? | |
| Do the tag prefixes correctly represent the entity providing the data? | |
| Have any Tag ID numbers been used in previous data submissions? | |
| Are TCEQ station location (SLOC) numbers assigned? | |
| Are sampling dates in the correct format, MM/DD/YYYY with leading zeros? | |
| Are sampling times based on the 24-hour clock (e.g., 09:04) with leading zeros? | |
| Is the Comments field filled in where appropriate (e.g., unusual occurrence, sampling problems, unrepresentative of ambient water quality)? | |
| Submitting Entity, Collecting Entity, and monitoring type codes used correctly? | |
| Do sampling dates in the Results file match those in the Events file for each Tag ID? | |
| Are values represented by a valid parameter code with the correct units? | |
| Are there any duplicate parameter codes for the same Tag ID? | |
| Are there any invalid symbols in the Greater Than/Less Than (GT/LT) field? | |
| Are there any Tag IDs in the Results file that are not in the Events file or vice versa? | |
| Data Quality Review | Yes, No, or NA |
| Does the data conform to quality assurance specifications as outlined in the QAPP? | |
| Are "less-than" values reported at the LOQ? If no, explain in the data summary. | |
| Have the outliers been verified and a "1" placed in the Verify_flg field? | |



| | |
|---|------------------------------|
| <p>Have checks on correctness of analysis or data reasonableness been performed?</p> <p>For data reasonableness: If the maximum reported values are higher than expected, check the site location for the value. Does the site typically have values that high? If yes, the value may be accurate. If the value is higher than expected for that site, conduct a review and develop an explanation regarding the higher value. If an outlier warrants more information, additional evaluation or sampling may be needed.</p> <p>Example: Is ortho-phosphorus less than total phosphorus? Are dissolved metal concentrations less than or equal to total metals? Is the minimum 24-hour DO less than the maximum 24-hour DO? Do the values appear to be consistent with what is expected for the site?</p> | |
| <p>Have at least 10% of the data in the data set been reviewed against the field and laboratory data sheets?</p> | |
| <p>Are all parameter codes in the data set listed in the QAPP?</p> | |
| <p>Are all stations in the data set listed in the QAPP?</p> | |
| <p>Documentation Review</p> | <p>Yes, No, or NA</p> |
| <p>Are blank results acceptable as specified in the QAPP?</p> | |
| <p>Were control charts used to determine the acceptability of field duplicates?</p> | |
| <p>Was documentation of any unusual occurrences that may affect water quality included in the Event File Comments field?</p> | |
| <p>Were there any failures in sampling methods or deviations from sample design requirements that resulted in unreportable data? If yes, explain in the data summary.</p> | |
| <p>Were there any failures in field or laboratory measurement systems that were not resolvable and resulted in unreportable data? If yes, explain in the data summary.</p> | |
| <p>Was the laboratory's NELAP accreditation current for analysis conducted?</p> | |
| <p>Have all special characters e.g., !@#\$%^*()\ been removed from the Comments field?</p> | |



Exhibit 4B. Example Data Summary



Instructions: This template is to be used by the planning agency and should contain basic identifying information about the data set, information regarding inconsistencies and errors identified during data verification and validation steps, or problems with data collection efforts.

Data Summary

Data Source:

Date Submitted:

TagID Range:

Date Range:

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

_____ This data set has been reviewed using the criteria in the data review checklist.

Planning Agency Data Manager: _____ Date: _____

Comments

Instructions: Please explain, using Table 4-2 below as a template, any data discrepancies discovered during data review including:

- Any inconsistencies with LOQs.
- Failures in sampling methods or laboratory procedures that resulted in data that could not be reported to TCEQ (indicate items for which the corrective action process has been initiated and send corrective action status report with the applicable progress report).
- Explanations for outliers (if known).

For example, dataset X contains data from FYXX QAPP Submitting Entity code XX and collecting entity XX. This is field and lab data that was collected by the collecting entity. Analyses were performed by the lab name. The tables on the following page explain discrepancies or missing data as well as calculated data loss.

Discrepancies or missing data for the listed Tag ID are shown below in Table 4-2:

Table 4-2. Monitoring Discrepancies

| Tag ID | Station ID | Date | Parameters | Type of Problem | Comment/PreCAPs/CAPs |
|-------------------------------|-------------------------|------------|-------------------------|-----------------|---|
| BP00339 | 17000 | 08/16/2011 | 00094 | Calibration | Not Calibrating/Pre-Cap #P065 *Recent probe Troubleshooting did not deal with the problem, may need to be sent for repairs |
| BP00340 | 17001 | 08/16/2011 | 00094 | Calibration | |
| BP00341 | 13230 | 08/16/2011 | 00094 | Calibration | |
| BP00342 | 13229 | 08/16/2011 | 00094 | Calibration | |
| BD0092 1 | 13272 | 09/20/2011 | 00094 | Unknown | Collecting entity did not provide an explanation as to why (00094) was not reported. Pre-Cap #P066 |
| BD0091 5 | 13272 | 06/21/2011 | 00300 | Field | DO value illegible |
| BF00267 | 13103 | 05/18/2011 | 00400 | Unknown | Collecting entity Did not provide an explanation as to why it was not reported. |
| BF00269 | 17596 | 07/26/2011 | 00300 | Field | Value was reported in percent saturated instead of $\mu\text{S}/\text{cm}$. |
| BA00237 BA00238 BA00239 | 13560 13208 18792 | 07/27/2011 | 00400 | Quality | Did not report pH because value was out of range. Pre-Cap #P062. |
| BM0045 6 | 13664 | 07/26/11 | 31699 32211 32218 | Shipping | No <i>E. coli</i> , pheophytin, chlorophyll- <i>a</i> due to late cooler |

Data Loss is shown below in Table 4-3.

Table 4-3. Data Loss

| Parameter | Missing Data points out of Total | Percent Data Loss for this Dataset | Parameter | Missing Data points out of Total | Percent Data Loss for this Dataset |
|-----------|----------------------------------|------------------------------------|-----------|----------------------------------|------------------------------------|
| 00094 | 5/27 | 19% | 31699 | 1/27 | 4% |
| 00300 | 2/27 | 7% | 32211 | 1/18 | 5.5% |
| 00400 | 4/27 | 15% | 32218 | 1/18 | 5.5% |

Note:

Instructions: Include any notes. For example, there were a total of 35 events, which consisted of 32 water samples, five of which were dry, and three sediment samples. Note inconsistencies in parameters reported due to the use of two labs for analysis. In addition, there are inconsistencies in parameters reported due to sites like X and Y, where not all parameters are reported. The following are the calculations of how many values should be reported for these parameters:

*Field: Five dry events, three sediment with no field, therefore total field parameters expected are 27 events.

*Conventional parameters: Five dry events, three sediment, nine field/bacteria with no conventionals. Therefore, total expected conventionals is 18. Partial conventional for ammonia, phos, nitrite+nitrate, and chlorophyll/pheophytin collected at 13103.

**E. coli*: Five dry events, three sediment only, therefore total bacteria parameters expected is 27. 22 expected at Lab1, five expected at Lab2.

Additional Notes:

* Three DO outliers and two ammonia outliers were verified by field staff and/or laboratory staff.

* Two *E. coli* results were reported as <10 MPN/100 mL as a result of 1:10 dilutions.

End of example text



Exhibit 4C. Understanding Biological Event Data Tagging

Figure 4-1. Biological Event Tagging

Biological Event Data

- Critical Event—August 23, 2011
- Site 17471—Llano River near Junction
- Collection included: 24H, Benthic Macroinvertebrates, Fish, Habitat
- The field and conventional data were collected 3 weeks earlier on 8/4/11
- Tag—L103942

Terminology

- In SWQMIS a Tag is called “RFA Tag #”
- Once the Tag gets loaded into SWQMIS, the system assigns a “Sample Set ID #”

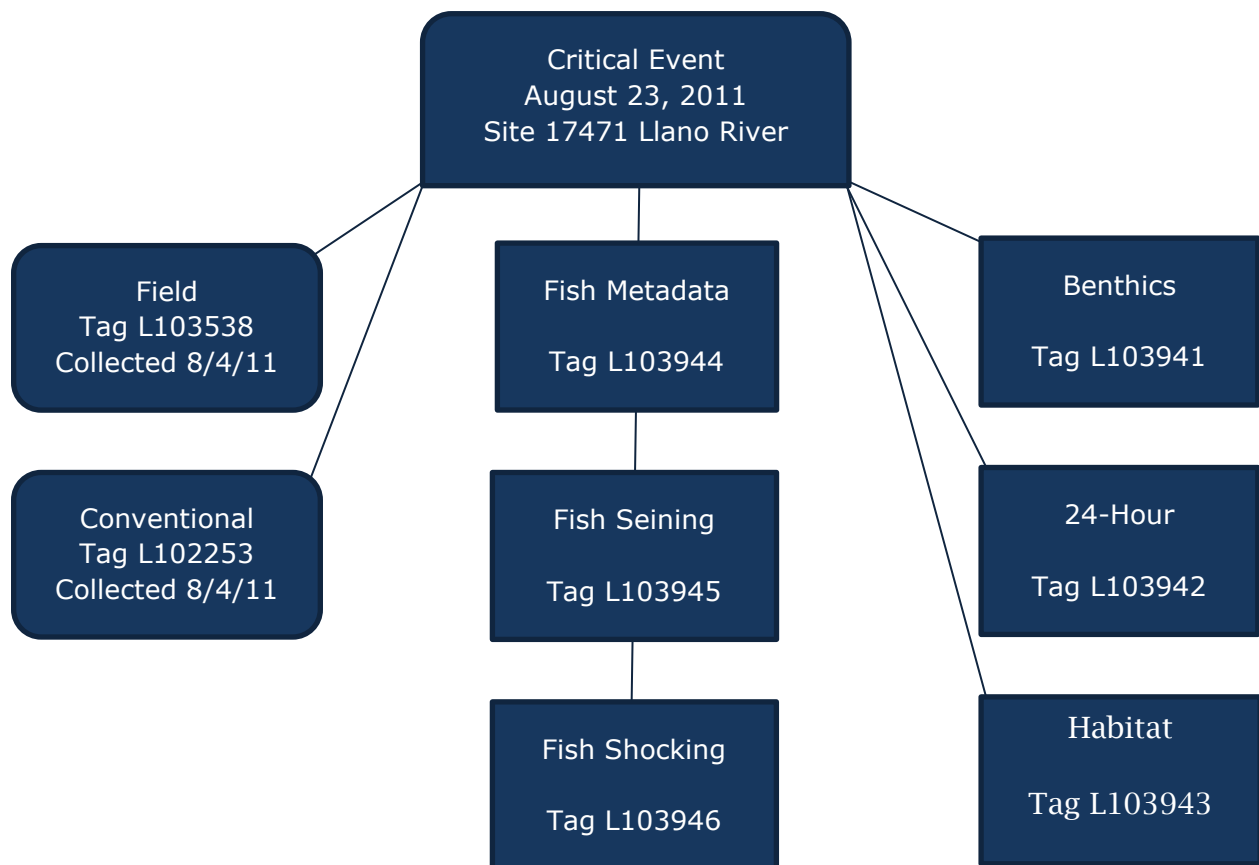
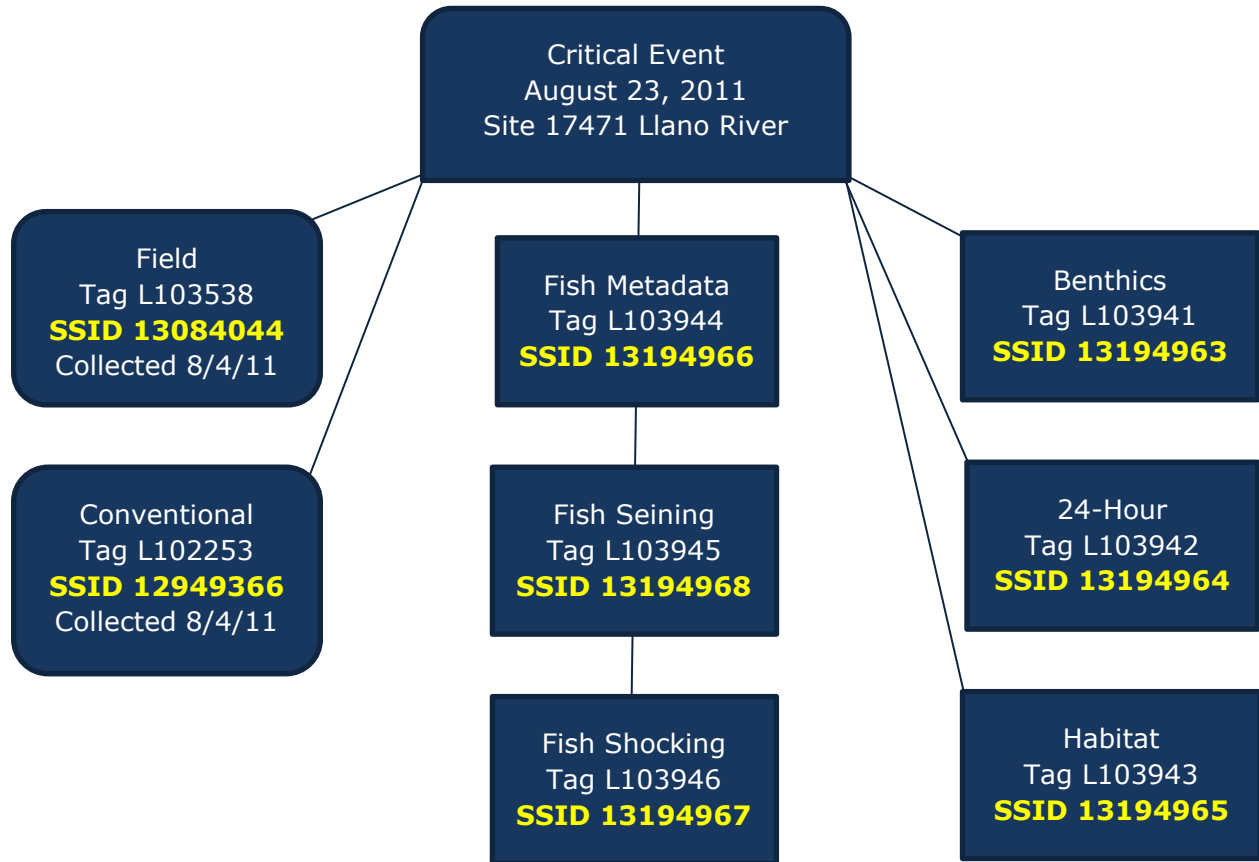
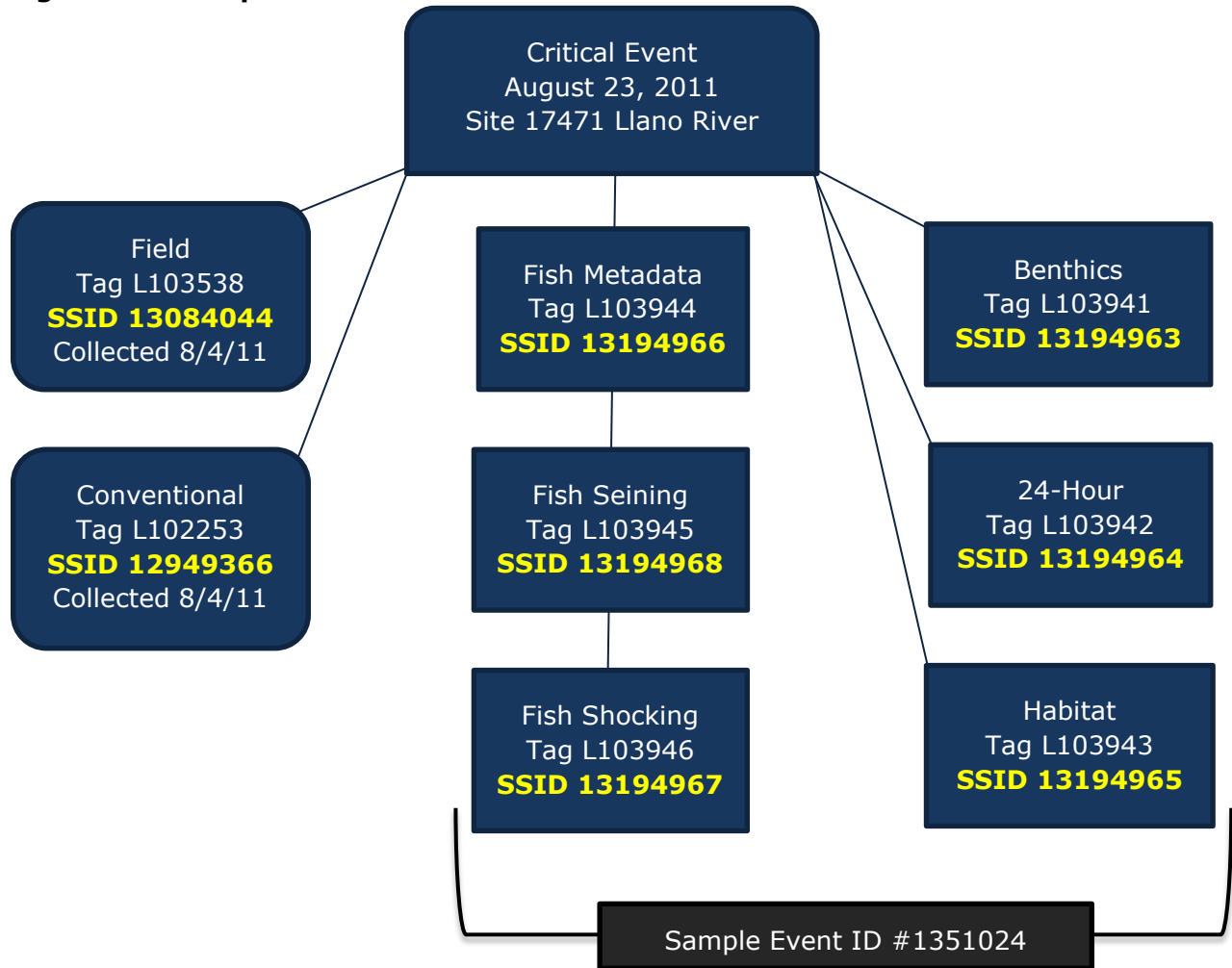


Figure 4-2. Sample Set Identification Structure³⁸



38. Once data are loaded to SWQMIS Production, SWQMIS assigns a Sample Set ID number (SSID) to each Tag/RFA Tag ID number.

Figure 4-3. Sample Event ID Structure³⁹



39. SWQMIS runs rules on data loaded into Production, and associates data collected by the same submitting entity at the same site and the same day plus or minus two days. The association results in a Sample Event ID number.

Figure 4-4. Read Me File Structure

ReadMe.txt

This file contains information about BLOB files. The ReadMe.txt file directs the TCEQ data manager where to attach each BLOB file. These include site maps, the Stream Physical Characteristics Worksheet with the transect data, fish voucher photos, or other biological data related images. BLOB files must be named in the format that includes station ID, water body name, and sample end date. BLOB files can be attached at the sample event and sample set levels in SWQMIS by authorized TCEQ staff.

| BLOB File | Filename | Description | Tag ID |
|------------------|--|--|----------------------------|
| 1 | 17471-Llano RiverALM-2011SummaryReport1.pdf | 17471 Llano River Aquatic Life Monitoring Report for 2011 including sampling location map, checklist, and overall site information | Sample Event Level* |
| 2 | 17471-LlanoRiverALM-23Aug2011FishVoucherPhotos.pdf | 17471 Llano River fish voucher photos from the August 2011 seining and shocking sampling efforts | L103944 |
| 3 | 17471-LlanoRiverALM-23Aug2011-HabitatTransectPhotos.pdf | 17471 Llano River habitat transect photos from the August 2011 biological sampling event | L103943 |
| 4 | 17471-LlanoRiverALM-23Aug2011-HabitatTransectWorksheet.pdf | 17471 Llano River habitat transect data and map from the August 2011 biological sampling event | L103943 |

***Sample event ID # 1351024, assigned by SWQMIS after data loaded into production**

Exhibit 4D.

Binary Large Object (BLOB) File Guidance and Examples

This document provides guidance for submitting biological data. For guidance in the collection of the biological data consult the TCEQ [Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data](#)⁴⁰ (RG-416) in conjunction with the TCEQ [Guidance for Assessing and Reporting Surface Water Quality in Texas](#).⁴¹

General requirements and limitations for BLOB files:

- Files may be in a PDF, Microsoft Word, Microsoft Excel, or PowerPoint Format; PDF is preferred.
- Each file should include in its heading monitoring station ID, station short description (when possible), and collection date.
- Maximum size for each file is 15 megabytes.
- Maximum number of files that can be attached per Event or per Sample Set is five.

Items below may be necessary as a part of biological data reporting. These items should be combined and submitted electronically to TCEQ. See Appendix C of the TCEQ *Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data* (RG-416) for field forms and [DMRG Chapter 12](#)⁴² for additional information about BLOBs.

The following are required elements for submitting BLOB files:

- ReadMe file (see Table 4-4)
- ALM checklist.
- Site map(s).
- Nekton voucher photos.
- Habitat transect photos.
- Habitat transect worksheet.

40. www.tceq.texas.gov/publications/rg/rg-416

41. www.tceq.texas.gov/downloads/water-quality/assessment/integrated-report-2022/2022-guidance.pdf

42. www.tceq.texas.gov/downloads/water-quality/data-management/reference-guide/dmrg-ch12.pdf



- Any other file discussed between the planning agency and the TCEQ CRP project manager and specified in the QA document.

Table 4-4. Read Me File Example (ReadMe.txt)

This file contains information about BLOB files. The ReadMe.txt file directs the TCEQ Data Manager where to attach each BLOB file. See Chapter 12 of the DMRG for additional information and an example.

| File Name | File Description | Tag ID |
|--|---|-----------------|
| 12830_MedinaRiver_Transects_3_18_14.pdf | 12830 Medina River at Old English Crossing 3/18/14 Habitat Transect Data (Stream Physical Characteristics Worksheet) | SA1545 3 |
| 12830_MedinaRiver_HabitatPhotos_3_18_14.pdf | 12830 Medina River at Old English Crossing 3/18/14 Habitat Transect | SA1545 3 |
| 12830_MedinaRiver_NektonPhotos_3_18_14.pdf | 12830 Medina River at Old English Crossing 3/18/14 Seining and Shocking Voucher Photos | SA1545 2 |
| 12830_MedinaRiver_SiteMap_3_18_14.pdf | 12830 Medina River at Old English Crossing 3/18/14 Site Map | Sample Event |
| 12830_MedinaRiver_ALM_3_18_14 Summary Report.pdf | 12830 Medina River at Old English Crossing 3/18/14 Aquatic Life Monitoring Checklist | Sample Event |
| 14929_SaladoCreek_Transects_4_3_14.pdf | 14929 Salado Creek at Comanche Park 4/3/14 Habitat Transect Data (Stream Physical Characteristics Worksheet) | SA1548 7 |
| 14929_SaladoCreek_HabitatPhotos_4_3_14.pdf | 14929 Salado Creek at Comanche Park 4/3/14 Habitat Transect Photos | SA1548 7 |
| 14929_SaladoCreek_NektonPhotos_4_3_14.pdf | 14929 Salado Creek at Comanche Park 4/3/14 Seining and Shocking Voucher Photos | SA1548 5 |
| 14929_SaladoCreek_SiteMap_4_3_14.pdf | 14929 Salado Creek at Comanche Park 4/3/14 Site Map | Sample Event |
| 14929_SaladoCreek_ALM_4_3_14 Summary Report.pdf | 14929 Salado Creek at Comanche Park 4/3/14 Aquatic Life Monitoring Checklist | Sample Event |

Figure 4-5. ALM Checklist Example

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 or snags): X
 Quantitative (Surber, snags, or dredge): —

Habitat assessment event 1:
 TCEQ habitat protocols: Yes No

Stream flow measurement event 1
 Instantaneous flow 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 or snags): X
 Quantitative (Surber, snags, or 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 flow measurement: Yes No
 USGS gauge reading: Yes No

Assessment Results (Optional)

Fish community index event 1:
 Exceptional High Intermediate Limited

Fish community index event 2:
 Exceptional High Intermediate Limited

Benthic macroinvertebrate community index event 1:
 Exceptional High Intermediate Limited

Benthic macroinvertebrate community index event 2:
 Exceptional High Intermediate Limited

Habitat index event 1:
 Exceptional High Intermediate Limited

Habitat index event 2:
 Exceptional High Intermediate Limited

Figure 4-6. Site Map Example

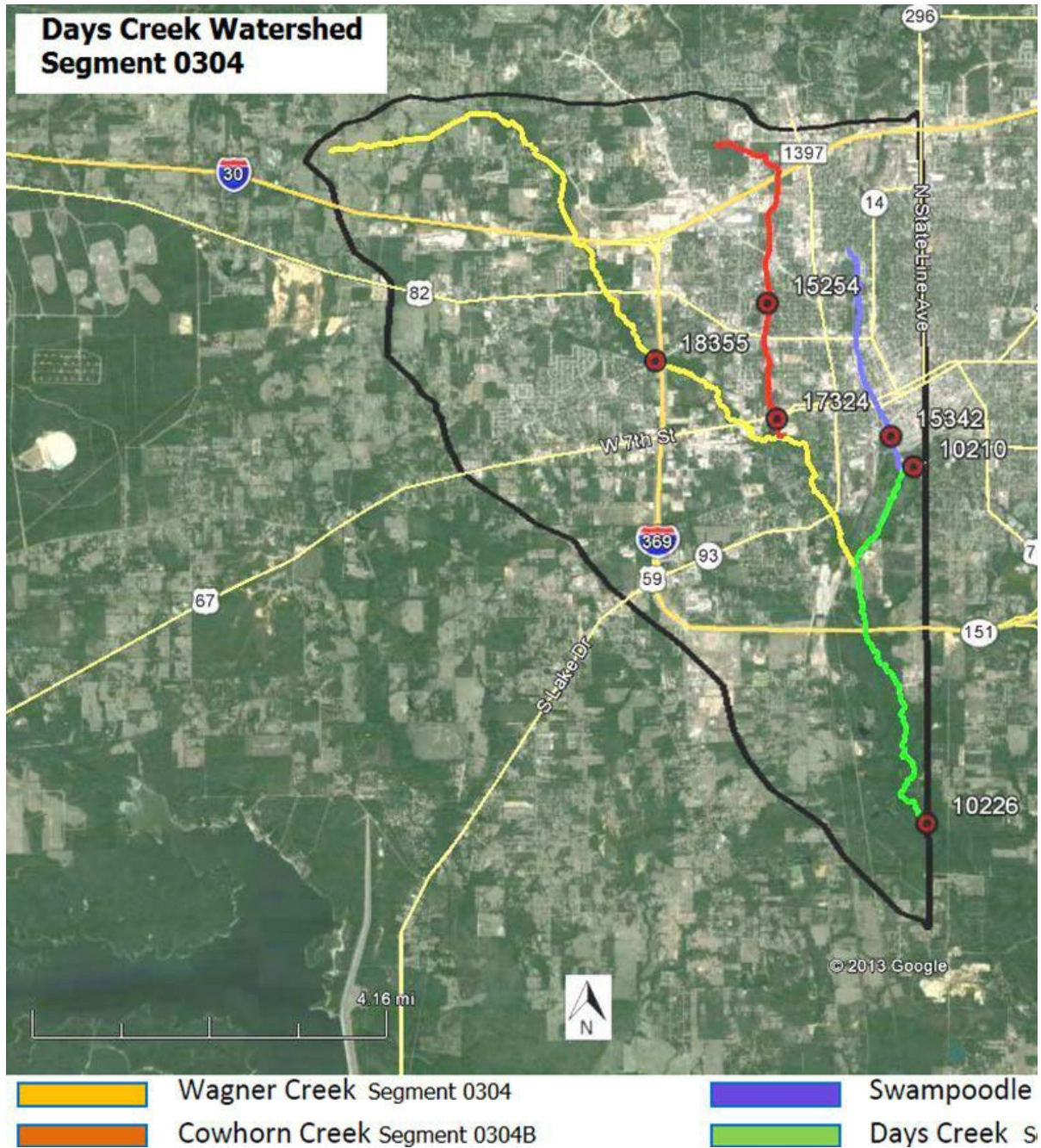


Figure 4-7. Fish Voucher Photos Example

**Colorado River Above Lake Buchanan
TCEQ ID 20641**

fish voucher photos
05/15/2013

Pimephales vigilax



Lepomis cyanellus



Figure 4-8. Habitat Transect Photos Example

San Saba River at San Saba CR 340
TCEQ ID 20662

Habitat Transect Photos
03/27/2013



Upstream View



Left Bank View



Right Bank View

Transect 1



Downstream View

Figure 4-9. Habitat Transect Worksheet Example

Habitat Transect Worksheet, 20662_SanSabaRiver_Transects_3_27_13.pdf

| Stream Physical Characteristics Worksheet | | | | |
|---|---|---------------|---|---------------|
| Observers: | Djurecka, Dcowan, Jwoods, CPetri, FMe | | Date: | 3/27/2013 |
| Weather Conditions: | Partly Cloudy, 45 deg F, N wind at 15 mph | | | |
| Stream: | | | Site ID: | 20662 |
| Location of site: | San Saba River at San Saba CR 340 | | Segment: | |
| Obs Stream Uses: | Recreation, Agriculture | | Reach: | 500 m |
| Stream Type: | perennial | | intermittent with perennial pools | |
| Stream Bends: | 4 | Well Defined: | 2 | Mod Defined: |
| | | | 2 | Poor Defined: |
| | | | | 0 |
| Aesthetics | wilderness | natural | common | offensive |
| Channel Obstr/Mods: | 0 | | Number of Riffles: | |
| | | | 1 | |
| Channel Flow Status: | high | moderate | low | no flow |
| Riparian Vegetation | Left | Right | Stream Flow: | 31 cfs |
| % Trees | 15 | 8 | Max Pool Depth: | 3.5 m |
| % Shrubs | 10 | 3 | Max Pool Width: | 57 m |
| % Grasses&Forbs | 27 | 36 | Transect placement relative to a fixed point: | |
| % Cult. Fields | 0 | 0 | | |
| % Other | 48 | 53 | | |

Notes:

Site Map:

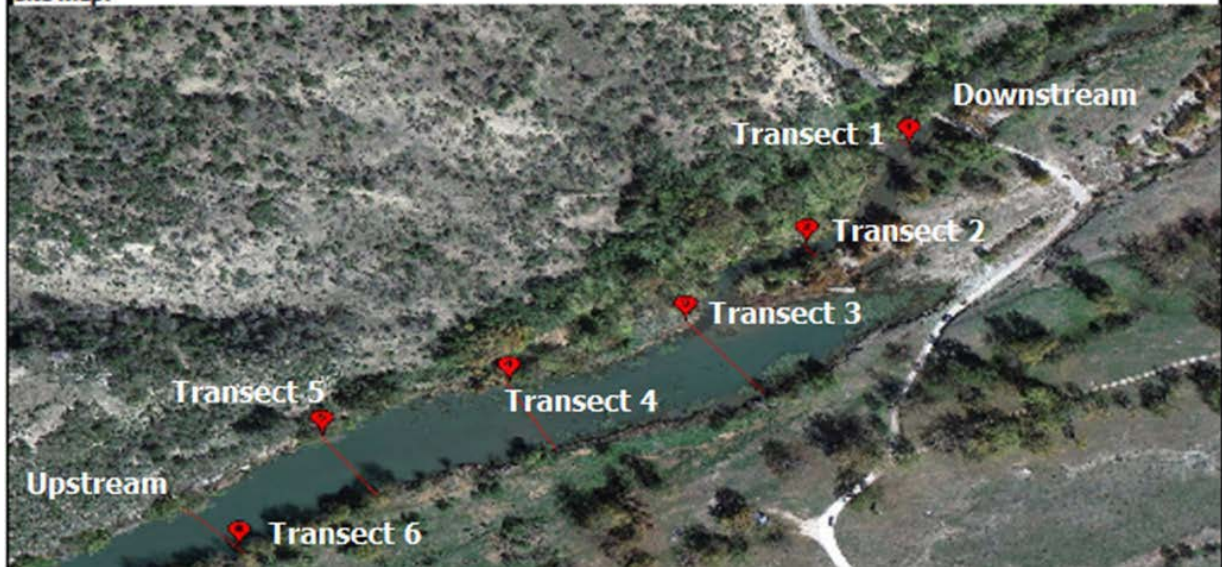


Figure 4-10. Habitat Transect Data Worksheet Example

| Habitat Transect Data | | | | | | |
|--|-----------------------------------|------------|------------|------------|------------|------------|
| Date | 3/27/2013 | | | | | |
| Site | San Saba River at San Saba CR 34(| | | | | |
| TCEQ ID | 20862 | | | | | |
| | Transect 1 | Transect 2 | Transect 3 | Transect 4 | Transect 5 | Transect 6 |
| Stream Type (Riffle,Run,Glide, or Pool) | RI | G | RU | P | P | P |
| Stream Width | 23.8 | 12.4 | 24 | 57 | 57 | 50.5 |
| Left Bank Slope | 90 | 60 | 15 | 125 | 125 | 90 |
| % Left Bank Erosion | 15 | 25 | 40 | 75 | 80 | 80 |
| Left Bank Width of Natural Buffer Vegetation | >20 | >20 | >20 | >20 | >20 | >20 |
| Right Bank Slope | 75 | 25 | 3 | 35 | 90 | 25 |
| % Right Bank Erosion | 70 | 70 | 5 | 80 | 70 | 70 |
| Right Bank Width of Natural Buffer Vegetation | >20 | >20 | >20 | >20 | >20 | >20 |
| % Tree Canopy | 32.4 | 39.7 | 0.0 | 47.1 | 50.0 | 50.0 |
| Dominant Substrate Type <small>(1=clay,2=silt,3=sand, 4=gravel,5=cobble, 6=boulder,7=bedrock,8=other)</small> | 5 | 2 | 3 | 2 | 7 | 2 |
| Stream Depth at Point 1 | 0.10 | 0.02 | 0.03 | 0.28 | 0.10 | 0.50 |
| Stream Depth at Point 2 | 0.03 | 0.18 | 0.25 | 1.00 | 1.28 | 1.45 |
| Stream Depth at Point 3 | 0.04 | 0.36 | 0.43 | 0.90 | 1.90 | 2.60 |
| Stream Depth at Point 4 | 0.00 | 0.55 | 0.22 | 0.70 | 1.94 | 3.22 |
| Stream Depth at Point 5 | 0.12 | 0.75 | 0.53 | 0.72 | 1.88 | 3.50 |
| Stream Depth at Point 6 | 0.15 | 0.80 | 0.22 | 0.88 | 2.00 | 3.44 |
| Stream Depth at Point 7 | 0.23 | 0.76 | 0.16 | 0.93 | 2.00 | 3.38 |
| Stream Depth at Point 8 | 0.13 | 0.72 | 0.18 | 1.12 | 1.90 | 3.30 |
| Stream Depth at Point 9 | 0.14 | 0.45 | 0.20 | 1.35 | 1.94 | 3.20 |
| Stream Depth at Point 10 | 0.07 | 0.31 | 0.15 | 1.03 | 1.63 | 2.01 |
| Stream Depth at Point 11 | 0.03 | 0.03 | 0.12 | 0.30 | 0.30 | 0.65 |
| % Substrate Gravel or Larger | 98 | 30 | 5 | 40 | 50 | 0 |
| Maximum Thalweg Depth | 0.23 | 0.8 | 0.53 | 2 | 2 | 3.5 |
| % Instream Cover | 85 | 15 | 30 | 25 | 10 | 10 |
| Macrophyte Abundance <small>(1=Abundant, 2=Common, 3=Rare, 4=Absent)</small> | 2 | 2 | 1 | 1 | 4 | 3 |
| Algae Abundance <small>(1=Abundant, 2=Common, 3=Rare, 4=Absent)</small> | 2 | 3 | 3 | 3 | 3 | 3 |
| Left Bank % Trees | 20 | 10 | 0 | 20 | 25 | 15 |
| Left Bank % Shrubs | 40 | 0 | 15 | 0 | 0 | 5 |
| Left Bank % Grasses, Forbs | 20 | 60 | 45 | 20 | 5 | 10 |
| Left Bank % Cult Fields | 0 | 0 | 0 | 0 | 0 | 0 |
| Left Bank % Other | 20 | 30 | 40 | 60 | 70 | 70 |
| Right Bank % Trees | 10 | 10 | 0 | 10 | 5 | 10 |
| Right Bank % Shrubs | 20 | 0 | 0 | 0 | 0 | 0 |
| Right Bank % Grasses, Forbs | 20 | 30 | 80 | 20 | 30 | 35 |
| Right Bank % Cult Fields | 0 | 0 | 0 | 0 | 0 | 0 |
| Right Bank % Other | 50 | 60 | 20 | 70 | 65 | 55 |
| Transect Latitude | 31.19072 | 31.19003 | 31.18950 | 31.18908 | 31.18872 | 31.18794 |
| Transect Longitude | -98.90272 | -98.90322 | -98.90381 | -98.90467 | -98.90558 | -98.90600 |



Exhibit 4E. SWQMIS Validations

SWQMIS performs several initial validations which includes:

- Checks for correct file formats as specified in the DMRG.
- Checks for validity of the following codes by cross-referencing them against the SWQMIS reference tables:
 - Submitting Entity
 - Collecting Entity
 - Monitoring Type Codes
 - StationIDs
 - Tag Prefixes
 - Parameter Codes
- Checks the Result file for duplicate Parameter Codes on unique TagIDs.
- Checks the Event file for duplicate TagIDs that already exist in SWQMIS.

SWQMIS also checks records in the SWQMIS against the dataset for records with the same station, date, submitting entity, collecting entity, monitoring type code, depth, parameter codes, etc. to be sure that loading the current dataset would not create duplicate records in SWQMIS.

Field measurements should be rounded before data is submitted to TCEQ's SWQMIS. Some data loaded to SWQMIS are corrected automatically with the correct number of significant figures. General rounding rules, including rounding rules for laboratory data, can be found in Chapter 3 and final format for reporting field data (rounding, significant figures) can be found in Table 3.1 of the [Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods](#).⁴³ Also, please refer to Chapter 7 (Data Reporting) of the DMRG for additional information regarding data formatting.

43. www.tceq.texas.gov/publications/rg/rg-415



Exhibit 4F. Data Submittal Progress Report

Template for the Data Submittal Progress Report

Instructions: Provide a summary of the status of data submittal progress detailing the extent to which data collected have been submitted to TCEQ. The report should also include the data that was collected under the previous contract established for FY22-23 which were not able to be submitted to TCEQ prior to the end of the FY22-23 contract term and that will be submitted within the contract established for FY24-25. This report will be included as an attachment to the quarterly progress reports and can be submitted in a spreadsheet format. In addition to providing quarterly data submittal progress updates, the report will also provide a comprehensive final data submittal progress summary at the end of the contract period.

Include entries for each collecting entity or subparticipant in the QAPP to track data submittal progress including sampling dates, due dates, and data submittal dates. The report can be modified to include additional columns to track deliverables in preparation for the Feb. 1 and March 1, 2025 due dates associated with the “Call for Data” for the Texas Integrated Report.

Example:

Table 4-6. Data Submittal Progress Report

| SE | CE | Frequency (Quarterly, Monthly, etc.) | Expected Sampling Dates | Due to TCEQ by | Actual Sampling Dates | Date Data Submitted to TCEQ | Data Submittal Progress Comments |
|----|----|--------------------------------------|-------------------------|----------------|-----------------------|-----------------------------|----------------------------------|
| IB | MC | Quarterly | Nov. 2023 | 3/1/2024 | 11/1-11/5/2023 | 2/1/2024 | Submitted |
| IB | MC | Quarterly | Feb. 2024 | 8/1/2024 | 2/1-2/5/2024 | 5/1/2024 | Submitted |
| IB | MC | Quarterly | May 2024 | 12/1/24 | 5/1-5/5/2024 | 12/1/2024 | Submitted |
| IB | MC | Quarterly | Aug. 2024 | 12/1/24 | 8/1-8/5/2024 | 12/1/2024 | Submitted |



| | | | | | | | |
|----|----|-----------|-----------|----------|------------------|------------------|---|
| IB | MC | Quarterly | Nov. 2024 | 3/1/25 | 11/1-11/5/2024 | Outstanding | Quarterly routine data collected Nov. 2022. Delay in receipt of lab data. Plan to submit to TCEQ by 4/1 |
| IB | MC | Quarterly | Feb. 2025 | 8/1/25 | 2/1-2/5/2025 | To be determined | Field data received; lab data not received |
| IB | MC | Quarterly | May 2025 | 12/1/25 | To be determined | To be determined | |
| IB | MC | Quarterly | Aug. 2025 | 12/1/25 | To be determined | To be determined | |
| IB | LA | Quarterly | Nov. 2023 | 3/1/2024 | 11/1-11/5/2023 | 2/1/2024 | Submitted |
| IB | LA | Quarterly | Feb. 2024 | 8/1/2024 | 2/1-2/5/2024 | 5/1/2024 | Submitted |
| IB | LA | Quarterly | May 2024 | 12/1/24 | 5/1-5/5/2024 | 12/1/2024 | Submitted |
| IB | LA | Quarterly | Aug. 2024 | 12/1/24 | 8/1-8/5/2024 | 12/1/2024 | Submitted |
| IB | LA | Quarterly | Nov. 2024 | 3/1/25 | 11/1-11/5/2024 | 2/1/2025 | Submitted |
| IB | LA | Quarterly | Feb. 2025 | 8/1/25 | 2/1-2/5/2025 | To be determined | Field data received; lab data not received |
| IB | LA | | May 2025 | 12/1/25 | To be determined | To be determined | |
| IB | LA | | Aug. 2025 | 12/1/25 | To be determined | To be determined | |

Task 5: Data Analysis and Reporting

In This Task

| | |
|---|-----|
| About Task 5..... | 182 |
| Basin Highlights Report..... | 182 |
| Format for Basin Highlights Reports | 182 |
| The Standard Report..... | 183 |
| Watershed Characterization | 183 |
| Program Update..... | 184 |
| Basin Summary Report..... | 185 |
| Goals of the Report..... | 185 |
| Report Content | 186 |
| Preparing for the Report..... | 186 |
| Distribution Requirements | 187 |
| Review of the Basin Summary Report | 187 |
| Who’s Reviewing the Basin Summary Report?..... | 187 |
| Exhibit 5A. Standard Basin Highlights Report Outline and Examples..... | 189 |
| Exhibit 5B. Watershed Characterization Report: Content and Examples | 199 |
| Example Text..... | 202 |
| Exhibit 5C. Outline and Example for the Program Update Report..... | 208 |
| Exhibit 5D. Basin Summary Report Outline..... | 219 |
| Exhibit 5E. Data Analysis Steps (for the Basin Summary Report Watershed Summaries) | 226 |
| Exhibit 5F. Example Watershed Summary (Example for the Basin Summary Report)..... | 230 |
| Exhibit 5G. Priority Parameter Descriptions (Example for the Basin Summary Report Water Quality Terminology) | 248 |

About Task 5

This task involves the examination of water quality conditions through data analysis and reporting to establish a more complete understanding of water quality conditions within the basin. The water quality and biological data collected under the previous contract established for FY2022-2023 which were not able to be submitted to TCEQ prior to the end of the contract term must be used in the data analysis and reporting task for the contract established for FY2024-2025. The information in these reports will be communicated to basin stakeholders and will help shape decisions and the focus of work in the basin.

The major deliverables due as a part of this task are the:

- Basin Highlights Report (annually, except when Basin Summary Report is due)
- Basin Summary Report (once every third State Fiscal Biennium)

Basin Highlights Report

The Basin Highlights Report provides information on water quality conditions throughout the basin and updates on Clean Rivers Program activities from the previous year. This document needs to be both user-friendly and accessible to a wide audience. Therefore, document layout and content should provide information in a manner that explains why conditions exist. It is important to get stakeholder input on the format and content of the document prior to its finalization. For ease of distribution, the Basin Highlights Report does not need to be printed but can be provided to interested parties electronically (e.g., via a web link).

Format for Basin Highlights Reports

There are three different report formats a planning agency can use to communicate program activities and water quality information on an annual basis.

- The Standard Report
- Watershed Characterization Report
- Program Update

The different formats allow variety in the content of each year's report to reduce unnecessary repetition of information that does not change on an annual basis. The planning agency will coordinate with the TCEQ CRP project manager to determine which formats to write into the work plan. The planning agency will also negotiate report content with the project manager. Report format should fluctuate on a cycle like this:

- Year 1—Basin Summary Report
- Year 2—Program Update
- Year 3—Watershed Characterization (ABC and XYZ Watersheds)

- Year 4—Standard Basin Highlights Report
- Year 5—Watershed Characterization (DEF and TUV Watersheds)

The Standard Report

This report provides a complete overview of all major activities and water quality issues that occurred within the basin during the previous year. A recommended outline for the Standard Basin Highlights Report is provided in Exhibit 5A with examples of satisfactory text. At a minimum, the report should include:

- An overview of basin water quality monitoring describing each organization's participation.
- The top water quality issues in the basin for stakeholder prioritization and monitoring decisions.
- A description of water quality conditions for each segment or water body.
- A summary of findings from special studies.
- Maps showing the location of sampling sites and water quality issues.
- Map(s) showing the location of the basin or watershed within the state.
- Steering Committee and other public outreach activities.
- Instructions on how to become involved in Steering Committee meetings, volunteer monitoring, and other participation opportunities.
- Information on the CRP content featured on the planning agency's website.

Watershed Characterization

This report characterizes impaired water bodies or water bodies of interest by reviewing data, mapping land use and permits, tracking watershed events, reviewing information from site visits, and communicating with monitoring personnel, stakeholders, and local residents.

The goal of this report is to describe key sources that are likely to impact water quality and provide a collection of “on the ground” local knowledge for other TCEQ program areas to use when prioritizing monitoring efforts. This document will provide useful information about a watershed that can be used for a variety of purposes including Watershed Action Planning activities (see Task 6). An outline and example of the report is provided in Exhibit 5B. Characterization should occur by segment and include the following information:

- Segment descriptions
- Stream or reservoir hydrology
- Impairment or area of interest description
- Land use and natural characteristics

- Potential causes of impairment or interest
- Potential stakeholders
- Recommendations for improving water quality
- Map(s) showing the location of the basin or watershed within the state.
- Maps showing the location of sampling sites and water quality issues.
- Ongoing projects
- Images
- Major watershed events (present and future)

The Watershed Characterization report content must be coordinated and discussed in detail with the TCEQ CRP project manager while developing the work plan and prior to beginning the report. The project manager must review and approve the watersheds before characterization begins. The following conditions apply:

- Characterization must include one to three watersheds.
- Exceptions, upon approval, can be made due to watershed size or complexity.
- Watersheds must be of suitable size and have impairments (i.e., the smallest watershed cannot be repeatedly chosen unless justifications are presented and approved).
- New watersheds must be chosen each year or on a rotating cycle.
- Only discuss segments located within the watershed being characterized.

The TCEQ CRP project manager must approve any exceptions to these conditions.

Program Update

This report strives to provide a brief update on the major basin activities and water quality issues that occurred during the previous year. It should be undertaken to reduce repetition of information that does not change on an annual basis and be thought of as a shortened version of the Standard Basin Highlights Report.

An example of the Program Update Report is provided in Exhibit 5C. The report should include:

- An update on major basin activities, changes, and events.
- An update of basin water quality monitoring activities.
- An update on the top water quality concerns and issues in the basin.
- A summary of findings from special studies.
- Maps showing the location of sampling sites, major water quality issues, and the basin or watershed within the state.

- An update on public outreach and educational activities.
- Links to additional resources.

Basin Summary Report

The Basin Summary Report is designed to provide a comprehensive review of water quality data and involves a detailed discussion of data analysis findings. This report serves to develop a greater understanding of basin water quality conditions, identify trends and changes, and aid in making decisions regarding water quality issues in each river and coastal basin in Texas. The report is completed once every third state fiscal biennium for each river and coastal basin.

To aid in future planning, Basin Summary Reports are due according to the following rotation (Table 5-1). The particular year within the biennium that the Basin Summary Report will be produced will be detailed in contractual agreements.

Table 5-1. Basin Summary Report Rotational Schedule

| Biennium Due | River Authorities |
|--------------|---|
| 2024-2025 | Red River Authority Northeast Texas Municipal Water District Sulphur River Basin Authority Sabine River Authority International Boundary and Water Commission |
| 2026-2027 | Lower Neches Valley Authority Angelina & Neches River Authority Trinity River Authority Houston-Galveston Area Council |
| 2028-2029 | Lower Colorado River Authority Brazos River Authority Lavaca-Navidad River Authority Guadalupe-Blanco River Authority Nueces River Authority San Antonio River Authority |

Goals of the Report

This report serves to provide an explanation for *why* current water quality conditions exist by incorporating and interpreting the findings from the various data analysis functions. By

explaining the findings, we can better describe the reasons for the problem and potentially determine future action plans.

The information from the review will support the following functions:

- Developing monitoring plans and updating priorities.
- Enhancing knowledge and understanding of water quality issues.
- Verifying and explaining findings on the Texas Water Quality Integrated Report.
- Correlating water quality conditions with possible sources.
- Prioritizing water bodies for action.
- Selecting watersheds for special studies.
- Highlighting those sections of the basin that need more land use information.
- Assessing the success of water quality improvement projects.

Report Content

The outline and description of content for the Basin Summary Report can be found in Exhibit 5D—Basin Summary Report Outline. The outline is provided to ensure content is consistent from basin to basin. Input from report users has been favorable when all information specific to a watershed is cohesively presented to provide a more complete picture of water quality. This report should answer the questions most stakeholders have, which tend to be:

- What are the water quality issues?
- Why do the issues exist?
- What are the possible effects?
- What should be or could be done about it?

In the watershed summary section in Exhibit 5D, there is a stepped approach to help answer these questions. The data review and analysis methods, Exhibit 5E, that can help answer the questions include descriptive statistics (percentiles for comparison), trend analysis (changes over time), spatial analysis (differences from upstream to downstream, and watershed characteristics to describe why the issues exists).

Preparing for the Report

The following review process should be adhered to when preparing the Basin Summary Report:

- A planning meeting with the TCEQ CRP project manager and TCEQ CRP Task 5 Coordinator to discuss the format and organization of the report will occur prior to significant work on the report. Report framework and data analysis methods should be

discussed and confirmed. Typically, the meeting will occur in conjunction with the annual SWQM Workshop but can be scheduled separately as necessary.

- A pre-draft of at least one watershed summary will be submitted to the TCEQ CRP project manager by Dec. 15 for review.
- After the pre-draft is approved, a draft of the entire Basin Summary Report will be submitted to the TCEQ CRP project manager by March 15 for review and comment.
- After the draft of the Basin Summary Report is approved by the TCEQ CRP project manager, the planning agency will request input from stakeholders. The draft can be made available to the public by posting on the planning agency's website, through email, or at the Steering Committee meeting.
- A copy of the completed final report is due to the TCEQ CRP project manager electronically by May 31, and written approval must be obtained before the report can be distributed.
- As a part of the report development process, the planning agency will coordinate review and comments with fee payers and Steering Committee members as detailed in the TWC, Section 26.0135 and 30 TAC, Section 220.6.

Distribution Requirements

- A copy of the final report needs to be made available to each stakeholder. This may be accomplished by handing out copies at the Steering Committee meetings, putting the report on the Internet, or mailing notices of its availability in hard copy upon request.
- A copy of the final report will be submitted as a contract deliverable to the TCEQ CRP project manager.
- The planning agency must additionally fulfill the distribution requirements detailed in the Texas Water Code, Section 26.0135 and 30 Texas Administrative Code Section 220.6. Refer to those sections of the statutes and rules for additional requirements regarding the summary report.

Review of the Basin Summary Report

TCEQ reviews the Basin Summary Report to ensure that the document is meeting the minimum requirements of the report as set forth in Task 5 of the CRP Guidance.

Who's Reviewing the Basin Summary Report?

- TCEQ CRP Task 5 Coordinator
- TCEQ CRP project manager
- *TCEQ project manager's supervisor if significant issues warrant additional review or oversight

Additional considerations by TCEQ during the review:

- Grammar, punctuation
- Maps, map elements (north arrow, scale bar, title, etc.)
- Data analysis methodology
- Terminology
- Website links
- References to any TCEQ database, program, publication, etc.

Required changes vs. suggestions to improve the overall quality of the report.

Please be aware that TCEQ may make suggestions and comments regarding the content of the planning agency's Basin Summary Report; this includes both required changes and suggested changes. So, how does a planning agency distinguish between what is required and what is suggested? Guidelines for this are as follows:

- If the comment is related to any of the minimum requirements for the Basin Summary Report, as stated in Exhibit 5D—Basin Summary Report Outline, then that is a required change.
- Any comment which references TCEQ data, databases, programs, publications, etc. is a required change. It is imperative to accurately represent the products of TCEQ in CRP publications where they are referenced.
- Any additional comment, such as, grammar, punctuation, website links, map elements, terminology (not already referenced in the Task 5 Guidance) are typically suggested changes that the reviewers believe would strengthen the overall Basin Summary Report and better inform the basin stakeholders.



Exhibit 5A. Standard Basin Highlights Report Outline and Examples

Outline

This Year's Highlights

- What were the major events or occurrences during the previous year (positive and negative)?
- What major issues (e.g., extreme drought, land use changes, point sources, nonpoint sources, ongoing water quality issues, natural salt pollution, record flood) are affecting water quality for the basin?
- How have these events impacted water quality?
- What has been done to respond to water quality issues?

Water Quality Monitoring

This section involves a summary of the monitoring that was planned, or occurred, during the past year including any participating entities and special projects. Present information on monitoring for the current fiscal year, to include:

- Number of sites per entity, frequency, type of monitoring.
- Include a table of the CMS for the entire basin.
- Map and label sampling sites, water bodies, county boundaries, highways, and cities.
- Explain what the water quality parameters mean and why they are important.
- Provide a link to the webpage that shows the entire monitoring schedule.
- Highlight other organizations' participation in the monitoring program.

Water Quality Conditions

The key to ensuring this portion of the report is adequate is to answer the questions the reader would ask, such as “why are levels elevated and what is being done about it?” When the answers to the questions are unknown or cannot be estimated, this information gap should be stated. If the previous year's report (including Basin Summary Report) contains a description of water quality for each TCEQ segment, then this section can be copied from the previous year's report. A statement should be included that no new assessment information is available since the previous report. The examples provided after this outline are highly recommended.

Explain the TCEQ Assessment and Categorization Process

Explain the assessment and categorization methods used for the latest state-approved Texas Water Quality Integrated Report and provide the web address for reference.

Describe Water Quality

- For each segment or water body, provide a concise description of the key watershed and water body characteristics that draw a picture of water quality.
- Indicate the status of the segment or water body on the latest TCEQ Water Quality Inventory and provide some possible reasons if there is a Concern, Use Concern, or Impairment.
- Highlight those water bodies that may have a water quality issue, or are significant due to size, location, or public interest, but which do not have a Concern, Use Concern, or Impairment and provide some possible reasons why the water quality is an issue.

Provide Information on Current or Proposed Work in the Watershed

- Monitoring activities done in response to a water quality issue.
- Proposed monitoring needed to better describe water quality (e.g., diel sampling for two years; monthly sampling for bacteria under a variety of flow conditions for two years; collect total dissolved solids in sub-watersheds throughout the affected watershed to identify source areas).
- Description of special studies, activities to date, and any findings (reference special study reports that have been completed or will be completed soon).
- Accomplishments in the past year, or several years (e.g., 100 wells have been capped; 100,000 tons of manure have been composted and hauled out of the watershed; riparian buffers restored on over 15 miles of stream banks).

Map Water Quality Issues

The map(s) should be at a scale that allows the reader to recognize where sampling sites and water quality issues are in relation to major landmarks. It is important to show the location of factors influencing water quality, such as wastewater treatment plants, concentrated animal feeding operations, and row-crop operations to show their spatial relationship to the water quality conditions and the sampling sites.

- Highlight segments or sections of segments (e.g., assessment units (AUs)) with water quality issues (e.g., Concerns, Use Concerns, or Impairments).
- Include and label, at a minimum: streams, reservoirs, county boundaries, highways, cities, and segment boundaries.
- Include map(s) showing the basin or watershed within the state.

Stakeholder Participation and Public Outreach

- Describe opportunities for involving other monitoring entities in the program.
- State who is currently involved and their contribution.

- Explain the purpose of Steering Committee meetings (e.g., forum for providing input on water quality issues, establishing priorities for future work, and providing feedback on reports).
- Include a section on how individuals and organizations can get involved in the program.
- Outline efforts that have been taken to get more involvement in the program.
- Summarize prior Steering Committee discussions.
- Summarize volunteer monitoring activities in the basin.
- Include information on volunteer organizations and their activities, with contact information.

Website

- Provide an overview of the information available on the website.
- Provide links to important pages, especially those with further detail on issues discussed in this report and those that allow the public to check on upcoming events.

Example Text for the Standard Basin Highlights Report

This Year's Highlights

The most significant factor affecting water quality throughout the basin in 2018 was the severe drought. In the upper portion of the basin, much of the river east of the city went completely dry, forcing some residents to transport water to storage tanks at their homes. The decreased flows resulted in elevated chloride levels in the river above the reservoir. In the middle portion of the basin, the lake was 21 feet below average in August, a level not seen since 1984. The river at State Highway 180 also went dry. In November and December 2018, base flows returned to the river and many of its tributaries. The rains came with a cost, however. During one particularly heavy rain, approximately 37,000 fish were killed in the river when stormwater runoff transported pollutants that depleted the oxygen supply in the river.

The major events relating to water quality that occurred this year include the updated State of Texas Integrated Report, the completion of the first year of the Reservoir #1 Water Quality Monitoring Program, the initiation of the dissolved metals study, identification of a leaking sewer main, improvements to the city's #2 wastewater collection system, and a new fish consumption advisory for lake #4. The State's Integrated Report identified eight new concerns (three for nutrients, three for dissolved oxygen, and two for pH) and five new impairments (three for bacteria and two for dissolved oxygen). The Reservoir #1 Water Quality Monitoring Program was developed to address growing concerns over water quality conditions due to wastewater treatment facilities at the local paper mill. Significant improvements in wastewater discharge from the paper mill should help water quality in the long-term. In addition, the paper mill is in the process of renovating its wastewater treatment facility to significantly reduce waste loads.

For fiscal year 2019, the river authority has added four routine and three flow sites to the monitoring plan. Three of the routine sites are on river #1. These sites were added in response to concerns about water quality impacts resulting from increased public use of the river. The fourth site was added downstream of a petrochemical plant on river #2. A polluted groundwater plume has been identified very close to the river. Efforts have been made by the plant to keep the plume from entering the river. In addition, three sites were added to monitor flow monthly for one year so calculations could be made for wastewater effluent assimilative capacity. This data will replace assumptions made by TCEQ when assigning allowable permit effluent limits.

Water Quality Monitoring

Below (Table 5-2) is the sampling schedule for the river basin.

Table 5-2. Example River Basin Monitoring Schedule

| Sampling Entity | Field | Conventional | Bacteria | Biological | Metals in Water | Organics in Water |
|-----------------|-------------------------|-------------------------|-------------------------|------------|-----------------------------|------------------------------|
| River Authority | 20 monthly; 8 quarterly | 20 monthly; 8 quarterly | 20 monthly; 8 quarterly | 2 annually | 9 annually; 1 semi-annually | 2 semi-annually; 2 quarterly |
| TCEQ | 23 quarterly | 23 quarterly | 23 quarterly | | 5 annually; 4 semi-annually | 1 semi-annually |
| City | 4 quarterly | 4 quarterly | 4 quarterly | | | |

What are the Water Quality Groups?

Note: You may add other water quality groups in addition to the following examples.

Field—physical and chemical water quality characteristics that can be measured on-site. These generally include dissolved oxygen, specific conductance, pH, temperature, stream flow, flow severity, secchi disc, and field observations or conditions.

Conventional—chemical and biological constituents in water that typically require laboratory analysis, and generally include nitrogen, phosphorus, chlorophyll-*a*, total dissolved solids, and total suspended solids.

What is Dissolved Oxygen and Why is it Important?

Dissolved oxygen indicates the amount of oxygen available in the stream. Certain minimum concentrations are needed to support aquatic life. Dissolved oxygen can be reduced by several factors such as elevated water temperatures and the loading of organic substances that require oxygen for decomposition (e.g., plant debris and wastewater effluent).

Why do we Collect Nutrients?

To determine compliance with water quality standards that are set by TCEQ to protect human health and to determine if there is an unnatural loading of nutrients. High levels of nutrients can cause excessive plant growth which can lead to reduced dissolved oxygen in the stream; in turn this can reduce the survivability of fish. In addition, at certain levels nutrients can cause an excessive growth of algae which can result in taste and odor problems in drinking water.



See Exhibit 5G for example descriptions of priority parameter descriptions, which include dissolved oxygen and nutrients.

Water Quality Conditions

Note: You may format hyperlinks, shown in the examples, in the publication format of your organization rather than as shown in the following examples.

Example #1

Segment Description: The creek begins in northeastern County at about Farm to Market Road (FM) 2 and continues 15 miles to the confluence with the river south of City in County. The creek is typically a shallow, slow-moving stream flowing through gently rolling hills lined with agricultural fields and scrub oak trees.

Segment Concerns: In 2014, the Creek was identified as impaired for *E. coli*, with concerns for nutrients. Based on stakeholder input and land use analysis, sources contributing to the bacteria impairment include urban nonpoint sources, such as rapid urban development and pet waste in the upper portion of the watershed, and range cattle and wildlife sources in the middle and lower portions of the watershed. The nutrient concerns are related to significant inputs from wastewater treatment plants in the upper portion of the watershed with some spikes in ammonia found downstream of City.

Actions to Address Concerns: The Creek Watershed Partnership has completed the watershed protection plan (WPP) for the creek and its tributaries. The Creek WPP is the first watershed protection plan in the state to receive confirmation from EPA that it meets all nine elements of a WPP. The project has moved into the implementation phase of the WPP. Over seven tons of illegally dumped waste was removed from the stream at road crossings; training was provided for municipal officials, on-site septic systems maintenance providers and homeowners; and on-line educational computer modules were developed covering topics such as wastewater treatment, on-site septic systems and disposal for household hazardous wastes. Grant funding received in this phase is covering urban nonpoint source pollution management strategies for the cities of #1, #2, and #3, feral hog management education in the rural portions of the counties, and nonpoint source pollution outreach and education. A link to the status of activities and quarterly newsletters can be found at (insert webpage link).

Example #2

Segment Description: The creek extends 27 miles beginning in County, including the 3,100-acre Creek Reservoir to the confluence with the river in County. Because of the size of the drainage basin, this normally slow-moving creek can become a fast, flowing river during a typical Texas rainstorm. Much of the creek bottom is made up of sand with typical vegetation ranging from mesquite and huisache to large live oaks and anacua trees. Because of its rural setting and limited development, you can still find a wide range of Texas wildlife along its shores ranging from turkey and deer to red fox and bobcats.

Segment Concerns: The Creek Reservoir is used for cooling water by a coal-fired power plant. This use may impact aquatic life (temperature, dissolved oxygen). Other activities in the watershed that may impact water quality include oil field activities, increasing numbers of subdivision developments, land clearing on existing ranches along the creek, and introduction of non-native aquatic plant species into the creek system. The watershed is mostly rural, but is undergoing land use changes, including a renewed interest in uranium mining.

Actions to Address Concerns: An examination of the hydrology and groundwater recharge and discharge in the upper creek is being conducted by the U.S. Geological Survey. Surface water from the #1 and #2 Creeks and groundwater data from the #1 and #2 aquifers are being collected. The study will provide information that can be used to develop appropriate natural resource management strategies. The Uranium Corporation is proposing to lease property in County to mine uranium by in-situ leaching. In-situ mining is the stripping of uranium from underground formations by the injection of acid and water. The subsequent solution containing dissolved uranium is pumped to the surface and piped to a production facility. Interested in the possible impacts that this process could have on surface and ground water, stakeholders have asked CRP to collect background samples from the creek for radiological compounds. Those samples are being collected through fiscal year 2019.

Stakeholder Participation and Public Outreach

Focus on Outreach

This River Authority's Clean Rivers Program public outreach activities include involving stakeholders and committee members in the watershed management planning and analysis process and providing watershed and water quality education to the public.

There are three main groups that help set priorities and direct water quality assessment activities for the program. They include a Steering Committee, a Technical Advisory Group, and a Regional Monitoring Workgroup. For more information on the roles of these committees and how to get involved, please visit: (insert webpage link).

The river authority has instituted several new approaches to raising awareness of watersheds and water quality throughout the region. While continuing to participate in environmental festivals and outdoor events, the river authority has also devised ways to reach others who may not attend or have access to those types of events.

One approach has been direct mail outs. A brochure that summarizes Watershed #1 was mailed out randomly to approximately 3,000 residents in that watershed. Enclosed in the mailing was a postcard response survey that asked the recipient:

- How familiar were they with the concept of a watershed?
- Before receiving this document, did they know they lived in the watershed?

- Had they learned anything new about the health of the aquatic environment from the information provided?

Many of the cards received indicated that the recipient had never heard of the watershed concept, did not know they lived in the watershed, and did learn something about the health of the aquatic environment. In addition, almost half of the recipients who returned their survey cards requested more information.

How Do I Get Involved?

- Learn more about how to prevent nonpoint source pollution, request a FREE copy of our brochure, “What Watershed Do You Live In?”.
- Be aware of local laws and ordinances that aim to protect our waterways.
- Report spills, fish kills, or illegal dumping to TCEQ’s Environmental Complaint Hotline at 888-777-3186 or to Texas Parks and Wildlife at XXX-XXX-XXXX.
- Volunteer to monitor a nearby creek or lake. To join the River Authority Texas Watch team, please visit:(insert webpage link).
- Check out our Data Clearinghouse for information, interactive maps, online databases, and more at: (insert webpage link).
- Attend our next Clean Rivers Program Steering Committee Meeting which will be posted on our website at (insert webpage link).

Website

The River Authority Clean Rivers Program webpage contains a variety of different information. The Data Clearinghouse is full of information on watersheds, water quality, and includes other data resources. The main features of the clearinghouse are interactive mapping and customized water quality data query.

The complete 2022 Basin Summary Report, including trend analyses and detailed data reviews for each watershed, is available online at: (insert webpage link)

Special study summaries and reports are highlighted on the main CRP page at: (insert webpage link).

End of example text for the Standard basin highlights report.



Exhibit 5B. Watershed Characterization Report: Content and Examples

Instructions: Organize each segment numerically by segment number followed by the watershed name. Table 5-3 below is an example of the content to include for each watershed.

Table 5-3. Example Watershed Characterization Content

| Content | Description |
|--|--|
| Segment Description | Describes the segment, assessment unit boundaries contained in each segment, historically monitored sites and site(s) believed to be responsible for the impairment or interest. |
| Hydrologic Characteristics | Streamflow variability, reservoir dynamics, seasonality of flow, typical flow trends |
| Description of Water Quality Issue | Identify why the water body is listed and when it first appeared on the 303(d) List or why it is an area of interest. Include the number of samples, parameter(s) of concern or impairment, assessment results and the appropriate state standards for comparison. |
| Land Use and Natural Characteristics | Describe the land surrounding the segment with the help of Google Earth satellite imagery or GIS. Include cities, agricultural lands, location(s) of permitted discharges, landfills, quarry operations, industrial areas, animal feeding operations and oil and gas operations. Other information could be included, such as, topography, slope, soils, vegetation, wildlife, average annual precipitation, average high and low temperatures, eco-regions. |
| Potential Cause of Water Quality Issue | Identify possible causes of the water quality issue using satellite imagery, watershed surveys, and communication with stakeholders and staff from state and local agencies. |
| Potential Stakeholders | Companies, agencies, or organizations who have a vested interest in the area and who may have a representative serve as a stakeholder. |
| Recommended Actions | Proposed next steps based on potential causes of impairment or interest, number of years on the 303(d) List, quality of listing data and knowledge of the site. |
| Maps | Include Google Earth aerial images or GIS renderings beginning at the watershed level and “drilling down” to the monitoring site level. Maps define segment and assessment unit boundaries, watersheds, monitoring sites, permitted discharges and animal feeding operations. |
| Ongoing Projects | Describe current or future projects that will occur in the segment (e.g., TMDLs, special studies, NPS projects, etc.) |
| Major Watershed Events | Anticipated or known occurrences that have the potential to either positively or negatively impact water quality (e.g., new and amended permits, fish kills, flood and drought, implementing management measures, land development). |
| Images | Photographic images of the watershed and areas of interest |



Example Text

Segment # and Name

Segment Description: Segment # (see Figures 5-1 to 5-3) begins from a point just upstream of the confluence with the bayou and stretches up to its headwaters near the road in the County. The segment is approximately # miles long and has historically been monitored at the following sites (bolded sites are currently monitored):

- #—the creek at FM #
- #—the creek at SH #
- #—the creek at FM #, southwest of CR #
- #—the creek above Tidal at the Ranch

There are two impaired AUs in above tidal segment of the creek, #1 and #2. AU #1 is defined as the # miles surrounding SH #. AU #2 is defined as the upper # miles of the creek. Data responsible for the listings are from sites #, #, and #.

Hydrologic Characteristics: The median instantaneous flow at the site during the historical record of sampling events was 232 cubic feet per second (cfs) and 127cfs at FM. State of the site during high flows, is it flashy, evidence of scouring? Is it often affected by drought? What seasonal trends are observed?

Impairment and Area of Interest Description: Segment # is identified on the 2022 303(d) List for not supporting contact recreation and its designated aquatic life use. The segment was first listed for not meeting contact recreation criteria in 2012 and its aquatic life use in 2009.

In Segment #1, the geometric mean of 24 samples of *E. coli* that were assessed was 139 most probable number (MPN), exceeding the criteria of 126. The bacteria impairment is currently in category 5a, meaning a TMDL will be scheduled. The assessment indicated that dissolved oxygen levels were consistently low at monitoring sites in Segment #1. Twenty-four-hour average dissolved oxygen levels did not meet screening levels for three of four samples (75 percent), and 16 out of 32 grab samples (50 percent) were below screening levels triggering a concern for aquatic life use.

In Segment #2, three of six samples failed to meet the criteria for 24-hour average dissolved oxygen levels resulting in an impaired aquatic life use with limited data. From 2010 to 2012, TCEQ performed a use-attainability analysis (UAA) on Segment #2 to assess the aquatic life use and determine if the dissolved oxygen criterion of 5.0 mg/L was appropriate. Results of the biological portion of the UAA found that a high aquatic life use criteria was met. Analysis of the dissolved oxygen data did not show such clear results. Average dissolved oxygen levels varied from 2.0 mg/L to 4.0 mg/L at each site. At the time of this printing a report on the UAA was not completed. The dissolved oxygen impairment is currently in category 5b,

meaning a review of water quality standards for this segment will be conducted before a TMDL is scheduled. The TCEQ 2022 Integrated Report also identified concerns for dissolved oxygen levels and ortho-phosphorous based on data collected from site #.

Land Use: Based on satellite imagery, most of the land in the segment is farmed or ranched. There are two permitted dischargers at the upper end of Segment #1: the municipal water district, and the county power. The farm is a permitted facility that does not discharge into a stream but applies chicken manure to land in the area.

There are no urban developments in Segment #. A small subdivision is located along the river at the monitoring site. The houses appear to have been built in the 1960's and 1970's and presumably use septic systems. Two permitted discharges are located upstream of the monitoring site. One belongs to the corporation, a maker of solvents. The corporation has a permit to discharge 2.28 MGD of treated domestic wastewater and process water and is located eight miles upstream of the monitoring site. The other permit belongs to the chemical plant, a producer of polymers and plastics. The chemical plant has a permit to discharge 0.65 MGD of treated domestic wastewater and process water and is located two miles upstream of the monitoring site.

Possible Causes of Impairment or Interest: *Nonpoint Sources*—The creek is a meandering creek with oxbow lakes and natural dams that slow flow, creating pools of stagnant water and hindering aeration. The lack of aeration coupled with the breakdown of naturally occurring organics in the water may cause dissolved oxygen levels in the creek to frequently fall below the state criterion of 5.0 mg/L. Deer, hog, and bird populations likely contribute to bacteria levels in the creek. Further study would need to occur before determining the extent of bacteria from wildlife sources.

Agricultural—Practices such as plowing to the creek bank and watering cattle in-stream contribute to low dissolved oxygen and elevated bacteria levels. Farming practices in the area are not known, but the results of the UAA performed by TCEQ in 2021 may help determine current agriculture practices in the segment and their impact on water quality.

Wildlife—The field crew make every effort to sample upstream of the bridge at the sampling site, but sometimes access to a safe area upstream of the bridge is limited and samples are collected under the bridge. Influence of waste from birds nesting in the bridge is unknown. Deer live in the area upstream of the sampling site. According to a rancher, who has lived near the sampling site since 1960, feral hog populations have increased dramatically. Wildlife probably contributes to bacteria levels at the site, but the extent cannot be determined.

Urban Runoff—The city is less than a mile south of the site. GIS analysis shows that the western portion of the city drains storm water into the river upstream of the site.

Influences of Flow—Since Segment # is tidally influenced, flow is not measured at Site #. The influence of the tide and pulsed releases from upstream dams play a role in how bacteria are

transported, but further study is necessary to determine the extent of flow on bacteria at this site.

Potential Stakeholders:

- AgriLife Extension
- Landowners
- Natural Resource Conservation Service
- Texas Department of Agriculture
- Texas State Soil and Water Conservation Board
- Texas Parks and Wildlife Department
- United States Fish and Wildlife Service

Recommendation(s): After the Segment # UAA is complete, work with TCEQ to help determine the status of the water body and if a TMDL is needed. Continue to monitor monthly to obtain enough data for a full assessment in 2024. Evaluate wastewater collection infrastructure including a review of the City Clean Water Program Survey of the watershed to verify potential sources of bacteria.

Figure 5-1. Example Watershed Map

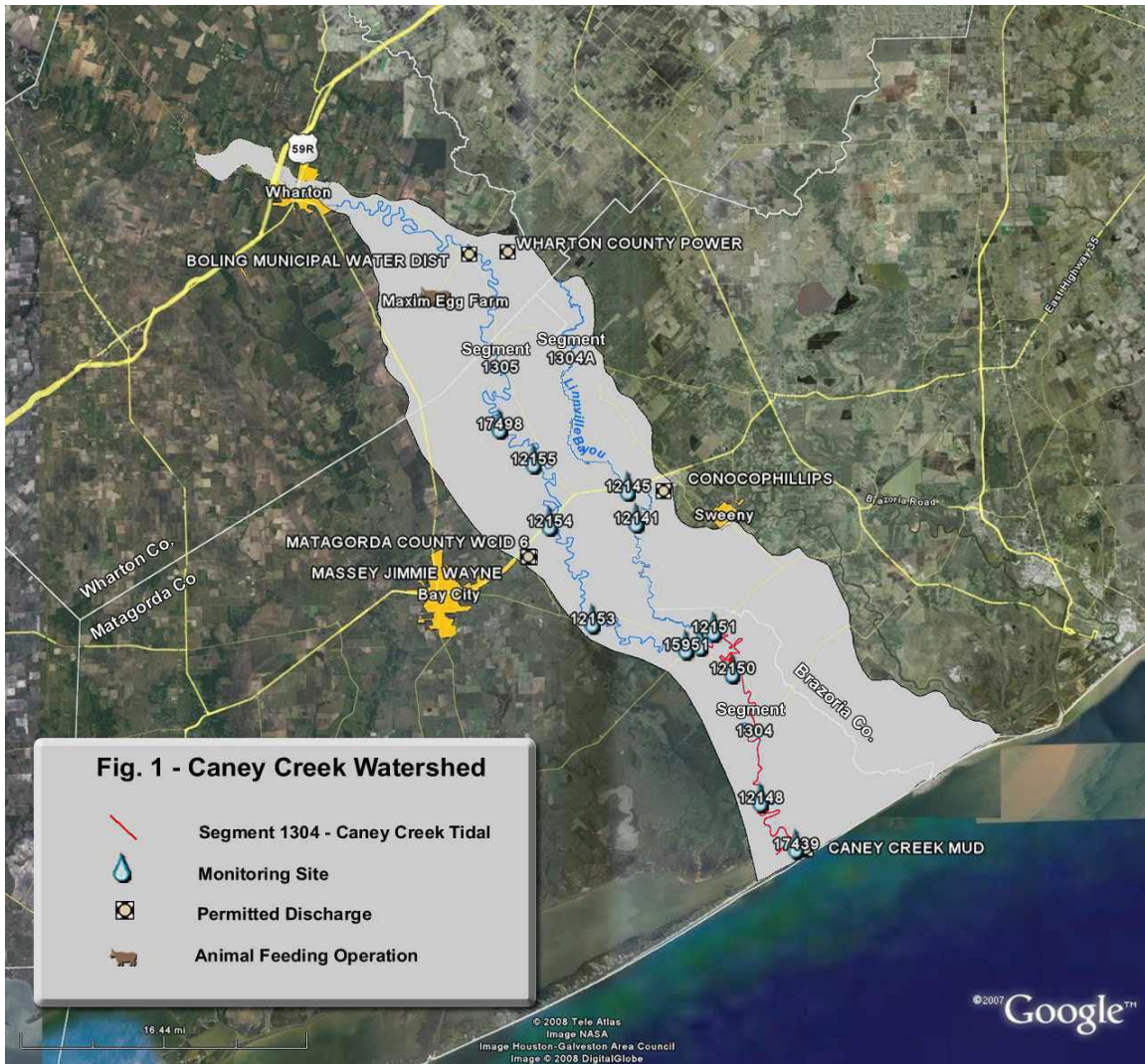
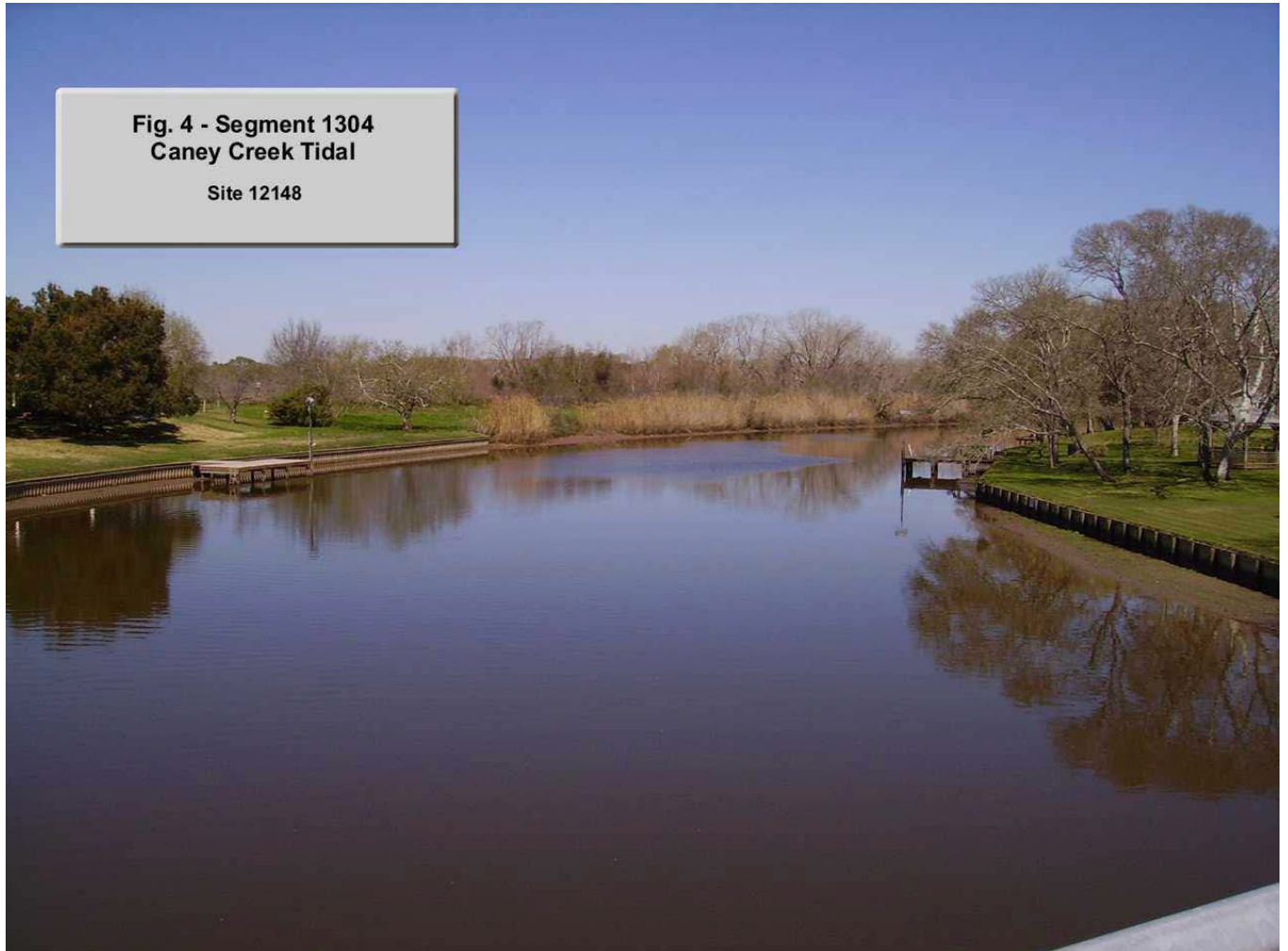


Figure 5-2. Example of a Segment Map



Figure 5-3. Example of a Monitoring Site Photo



**Fig. 4 - Segment 1304
Caney Creek Tidal
Site 12148**

End of example text.



Exhibit 5C. Outline and Example for the Program Update Report

Outline

Introduction

The Introduction should succinctly provide the reader with the purpose of the report and sufficient background to understand the scope of the Clean Rivers Program (CRP) and the information provided within the report.

This Year's Highlights

- What were the major events or occurrences during the previous year (positive and negative)?
- What major issues (e.g., extreme drought, land use changes, point sources, nonpoint sources, ongoing water quality issues, natural salt pollution, record flood) are affecting water quality for the basin?
- How have these events impacted water quality?
- What has been done to respond to water quality issues?

Public Involvement and How to Get Involved

This section describes basin efforts to promote public involvement in water quality issues. Planning agencies will summarize public information and education activities undertaken and evaluate the success of these activities.

Water Quality Monitoring

This section should include a summarization by segment of the monitoring that was planned, or occurred, during the past year including any participating entities and special projects. Present information on monitoring for the current fiscal year. Ideas for this section include:

- Number of sites per entity, frequency, type of monitoring.
- Provide a table showing water quality impairments and concerns from the Texas Water Quality Integrated Report.
- Provide a table of the CMS for the entire basin.
- Additionally, provide map(s) showing the basin(s) or watershed within the state.
- Show and label sampling sites, water bodies, county boundaries, highways, and cities.

The below figures (Figure 5-4 through Figure 5-12) are examples of a planning agency's Program Update report.

Example Figures

Figure 5-4. Example Program Update Report Page 1



Photo by Sara Robertson

The Houston-Galveston Area Council's Clean Rivers Program produces "How's the Water?" highlighting the region's water quality and various programs and plans that were implemented in the past year. This year, we turn our focus to "Where's the Water?" as we consider what happens when our region faces unprecedented drought.

Beginning in October 2010, the Houston-Galveston region has been suffering from one of the worst droughts on record. Though the rains in late 2011 and early 2012 made significant steps toward overcoming the rain deficit, as of February 21, 2012, most of the region is still classified as under drought conditions by the U.S. Drought Monitor. For a region that historically spends its time and resources developing plans to address too much water (floods, tropical storms, hurricanes), the challenge of solving the problems that arise when there is not enough water has been eye-opening. No longer can we consider water quality and water quantity in isolation from each other. This drought has been an excellent reminder that water is not an infinite resource, and a drought contingency plan must be a part of any resiliency or sustainability plan. This renewed awareness will be essential to protecting our most precious resource.

Figure 5-5. Example Program Update Page 2

2012 Basin Highlights Report ██████████

**Clean Rivers Program
 Assessment Basins**

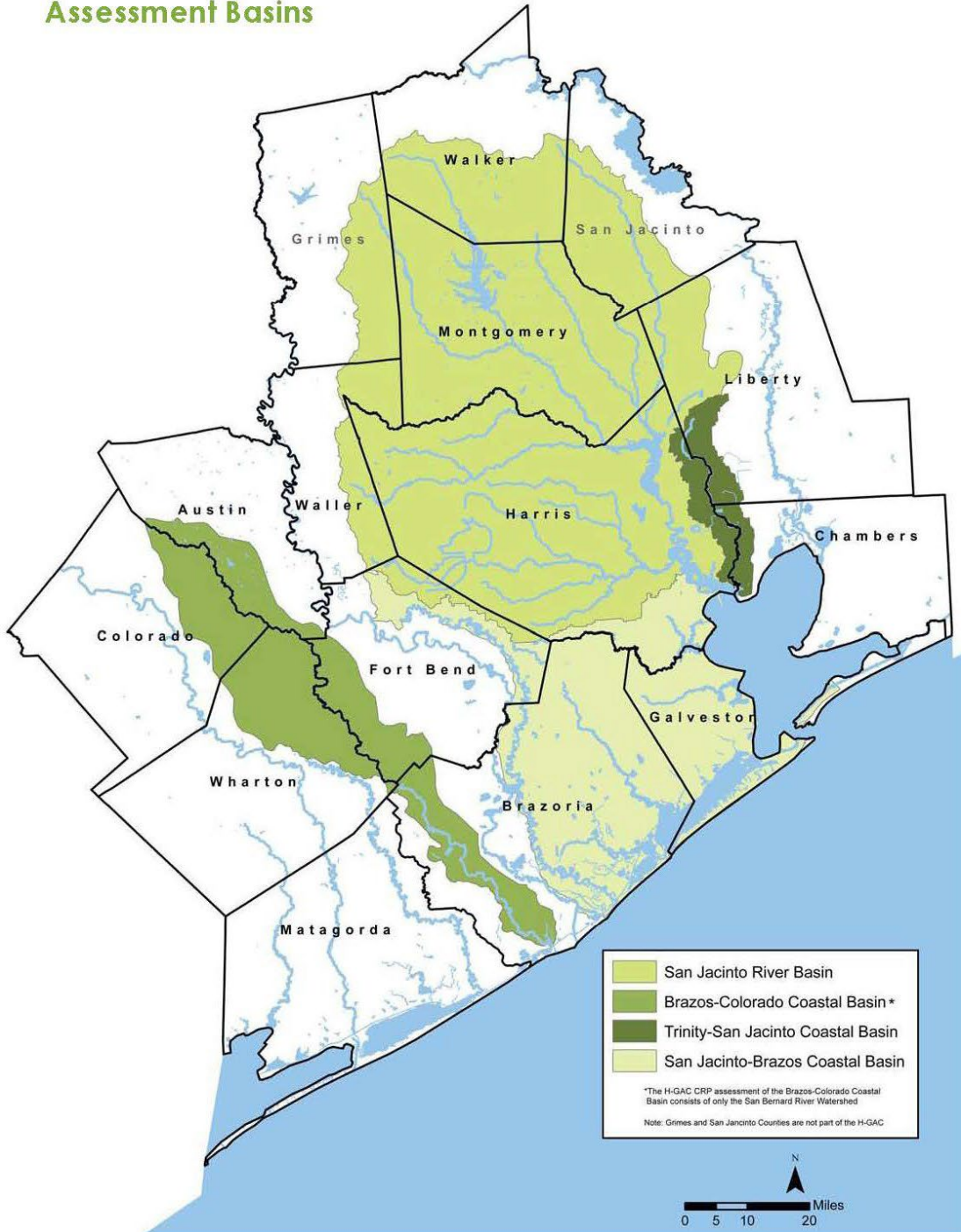


Figure 5-6. Example Program Update Page 3

2012 Basin Highlights Report

The Effects of the Drought

The drought had an immediate cost impact on not only water quality monitoring but also on other end users of surface water.

Partner Monitoring

Although very limited amounts of data were collected at many monitoring sites during the drought, partners still incurred travel costs. Local Clean Rivers Program partners did, however, realize savings by not sending as many water samples from these sites to labs for analysis.

Water Lines

Water lines are more prone to breakage during a drought. As the soil dries out it shrinks or moves, causing buried pipes to break. In June 2011, the City of Pasadena responded to 558 calls for water leaks and line bursts, compared to 99 service requests at the same time in 2010. By the end of 2011, the City of Houston had responded to and repaired 17,756 water line breaks, an increase from 10,821 in 2010. In September 2011, Houston City Council approved spending more than \$7 million for emergency water line repairs and continued to appropriate funds to repair lines through January 2012. Street repairs on top of water line breaks added time and expense.

Fishing and Oyster Harvesting

The drought had significant impact on commercial and recreational fishing in the region. Galveston Bay closed to all oyster harvesting on October 5, 2011, due to red tide. Other bay systems closed effective November 1, 2011, the beginning of the 2011-2012 commercial oyster harvesting season. According to the Galveston Bay Foundation, Galveston Bay's oyster fisheries produce more oysters than any other water body in the United States, and the Texas Parks and Wildlife Department indicates the oyster business in Texas lost an estimated \$7.5 million.

Trees

Thousands of trees throughout the region died as a result of the drought. In October 2011, the City of Houston contracted to spend \$4.5 million to remove dead trees in rights-of-way, public parks and forested park lands. As of February 15, 2012, the City of Houston has removed 17,900 of the dead trees. According to the Harris County Flood Control District, Centerpoint Energy has also removed 19,000 trees on their rights-of-way at a cost of \$5.1 million. The loss of tree canopy around area streams can be detrimental to water quality. Increased light can trigger nuisance algal blooms and cause daily water temperatures to increase, affecting the water's ability to hold dissolved oxygen (DO) and support aquatic life.

Photo by Houston Council Member Mike Sullivan

Silver Lining

When Lake Houston's water levels sank to historic lows, members of the Houston Police Department's Lake Patrol Department removed debris that was not visible or accessible when the lake was at full capacity. The debris removal ranged from navigational hazards, such as pilings, to large debris, including tires and vehicles.

Overall awareness of the importance of water has increased. As more people are seeking information about the drought, they are also learning about water conservation, water quality, watershed protection plans and other water related issues they may not have considered in the past.



Figure 5-7. Example Program Update Page 4

2012 Basin Highlights Report

Were We Ready?

The H-GAC Clean Rivers Program and our partners have never experienced a drought of this extent. Monitoring parameters, such as flow, DO and bacteria could not be measured at many sites due to the lack of water. While data was captured in some cases, it represents unusual conditions for a short period of time and is unlikely to cause a change in a streams assessment. H-GAC staff and local partners were unable to collect water quality data during 37 visits to monitoring stations from October 2010 through December 2011 because the sites were inaccessible due to low water levels, were completely dry, or had only small, isolated pools. In the 10 years prior to the drought, staff encountered low- or no-water circumstances only 11 times. Monitors at these dry sites could only report field observations, including the date, time, and weather but could not take field measurements or collect samples for lab analysis.

As a result, the TCEQ worked with monitoring partners across the state to develop drought-condition monitoring procedures so all partners will be more prepared to characterize the next drought. The new procedures, released in November 2011, direct the monitors to survey the stream bed at a site with no or low flow conditions to note pool coverage (length and depth of visible pools). Samples taken from appropriate pools (1 foot deep and 10 feet wide) may be used as a baseline for low flow conditions in the future.



Approximately 90% of Houston's Memorial Park's canopy cover has died as a result of the drought. (photo by Jim Olive)

11.18 inches

Average rainfall from October 2010 to September 2011 – 16 inches below normal (Office of the Texas State Climatologist, October 31, 2011)

100 percent

Percent of the state under drought conditions (U.S. Drought Monitor, September 27, 2011)

4 million

Approximate acres of land damaged or destroyed by wildfires (Texas Forest Service, November 2010 to February 2012)

500 million

Number of trees killed (Texas Forest Service, December 19, 2011)

\$5.2 billion

Agricultural losses (Texas AgriLife Extension Service at Texas A&M, August 17, 2011)

Figure 5-8. Example Program Update Page 5

2012 Basin Highlights Report

Where's the Water?

According to the TCEQ, at the height of the drought (September 2011) 916 water systems in the state were enforcing voluntary or mandatory water rationing in an effort to help conserve a rapidly depleting supply of water.

Though the region was not faced with the prospect of running out of water, like the community of Spicewood* in central Texas, all three of the City of Houston's water sources (Lake Houston, Lake Conroe and Lake Livingston) dropped to an average of 73% capacity by fall 2011. In February 2012, following above average rainfalls, Lake Livingston and Lake Houston had returned to 100% capacity, according to the Texas Water Development Board. Lake Conroe remained at 80.62% capacity, but that number continues to rise.

Lake Conroe reached much lower levels than Lake Houston and Lake Livingston as a result of the additional water being released from the Lake to the City of Houston. In August 2011, the City of Houston ordered a measured release of its share of the water rights in Lake Conroe because the city needed additional water to maintain operation of its Northeast Water Purification Plant. The City of Houston owns 70% of the water rights of Lake Conroe and Lake Livingston and 100% of the water rights of Lake Houston. In December 2011, Lake Conroe reached its

lowest water level when it fell to 8 feet below normal or 65.92% capacity. The City of Houston stopped calling for water to be released from Lake Conroe in November 2011.

*Spicewood's water supply was almost completely depleted by January 2012. The Lower Colorado River Authority brought water to the community from other LCRA water systems by tanker trucks.



Photo by Bill Hoffman

What's the Difference?

During routine monitoring of Persimmon Bayou in November 2011, professional monitors from the Environmental Institute of Houston (EIH) noted specific conductance, or the measure of salinity, was 20,000 micro Siemens/cm, which is significantly higher than it should have been for this fresh water or slightly brackish water site. (Sea water ranges from 48,000 to 58,000 micro Siemens/cm). In response to the EIH data, H-GAC submitted and TCEQ approved a request to reclassify the station as tidal instead of freshwater. In January, 2012, following a significant rainfall, conductance was once again measured at 200 microsiemens/cm. This site also saw a significant difference in bacteria levels - Escherichia coli (E.coli) levels of 200 MPN/100 mL in November, followed by an increase to 10,000 MPN/100 mL after the rain. Lower bacteria densities might suggest enhanced support for recreational uses, but higher salinity levels that accompanied them adversely affect aquatic life and reduce support for aquatic life uses.

This illustrates the potential for extreme swings in data during drought conditions. This site had historically produced conductance measurements of a freshwater site, but the lack of rain led to increases in measured conductance. The surge of freshwater from the rains significantly reduced the conductance. This occurrence also allows us to determine that bacteria levels at this site increased after a rainfall and therefore are significantly affected by runoff pollution.

Figure 5-9. Example Program Update Page 6

How's the Water?

The drought, although unwelcome, provided an opportunity for H-GAC and local partners to take a closer look at data collected to determine the impacts of drought on bacteria levels and other parameters. H-GAC staff analyzed water quality data collected during routine monitoring at stations on freshwater streams to investigate the effects of the drought on water quality by comparing the levels of *E.coli* bacteria, DO, and nutrients (phosphorus and nitrogen compounds) before and after the official start of the drought.

Bacteria

In the assessment units where *E. coli* is the indicator bacteria, 73% of the monitoring sites exhibited lower average bacteria levels than the seven-year period before the drought. Conversely, only 15% of the monitoring sites showed higher average bacteria levels. *E. coli* is the indicator bacteria for freshwater sites, while enterococci is the indicator bacteria for saltwater sites.

This supports the idea that runoff pollution is likely a significant source of *E.coli* in most streams. Several factors may also have contributed to the higher bacteria levels observed at several stations, including pollution from sources other than runoff. Poor quality effluent from waste water treatment plants, undetected broken sewer lines in the collection system, wildlife, and bird droppings could create areas of concentrated bacteria that would ordinarily be diluted during conditions of normal flow.

In addition to less runoff, lower bacteria levels could also be attributed to broken drinking water lines. In some instances broken water lines have leaked into waterways that normally have elevated bacteria levels. The disinfecting properties of chlorinated drinking water, coupled with dilution, may have temporarily decreased bacteria levels at the time of sampling. However, the reductions in bacteria levels did not mean that the stream was meeting the recreational water quality standard. Bacteria levels in most cases were still quite high but were less than previous levels.

Dissolved Oxygen and Nutrients

DO is vital to the health of aquatic ecosystems. Our analysis shows moderate, but significant, decreases in DO in the bays and estuaries in our region during the drought. DO problems are often caused by elevated nutrient levels, including total phosphorus. Prior to the drought, 36% of samples exceeded screening levels for total phosphorus. During the drought, 45% of samples exceeded these limits, and 74% of samples showed at least a 10% increase in median concentration of total phosphorus. Possible explanations for higher nutrient concentrations include higher evaporation rates and a higher proportion of phosphate-rich wastewater treatment plant effluent in area waterways.

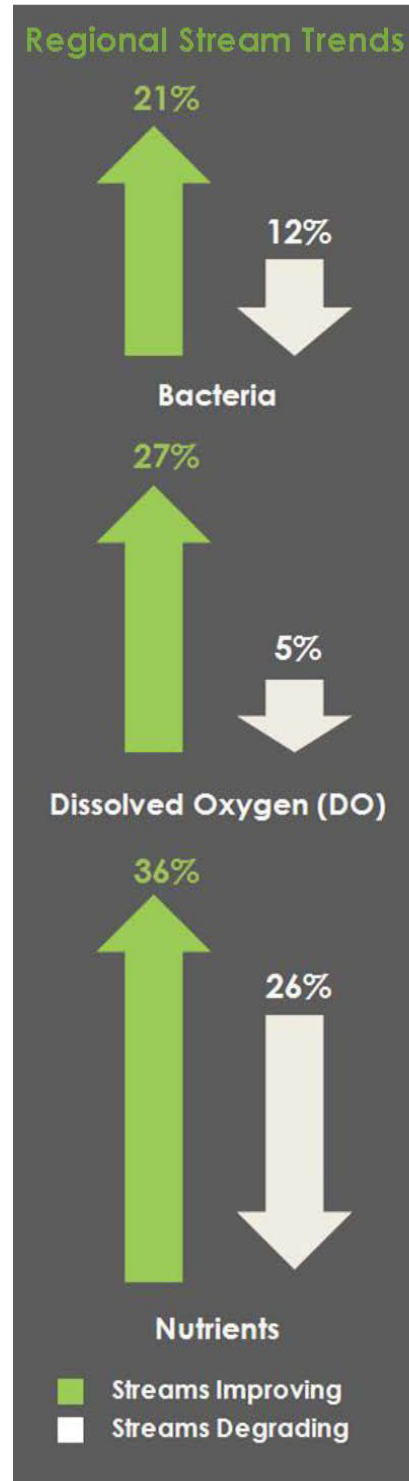


Figure 5-10. Example Program Update Page 7

2012 Basin Highlights Report

Nature's Contributions

According to the Texas Parks and Wildlife Department Spills and Kills Team, tidal tributaries in the Galveston Bay area experienced more frequent and more widespread fish kills during the drought than in previous years. The primary species killed was gulf menhaden. Low DO is the leading contributor to fish kills. During the drought, the region experienced higher water temperatures generally associated with low DO. Algal blooms also contributed to low DO.

As a result of little or no rainfall, water bodies are subject to lower than normal flows and can become stagnant. Nutrients in this stagnant water lead to flourishing algal blooms. This algae then consumes the oxygen overnight, drastically reducing the oxygen supply in the water and causing fish and other aquatic life to die.

High salinity also created problems for aquatic life in Galveston Bay. Texas Parks and Wildlife reports that Galveston Bay recorded the highest salinity (42 parts per thousand in West Bay in late summer 2011) since the department's routine monitoring was initiated more

than 30 years ago. Oysters need just the right balance of freshwater and saltwater to survive and thrive in Galveston Bay. According to Texas A&M University-Galveston, too much freshwater is devastating to the oyster population. However, too much saltwater, high temperatures, low wind and decreased fresh water inflows from rainfall contribute to ideal conditions for the influx of oyster predators and parasites (e.g. oyster drill and Dermo disease) or blooms of harmful algae such as red tide. Texas saw one of the longest occurrences of red tide in the state's history during the drought.

The Texas Department of State Health Services closed all Texas coastal waters to commercial and recreational harvesting of mussels, clams and oysters because of the red tide in October 2011. By early February 2012, some waterways, including portions of Galveston Bay, North and Central provisional areas and East Bay) and San Antonio Bay were re-opened. This was good news for the \$30-billion oyster industry.

Photo by Justin Bower



Figure 5-11. Example Program Update Page 8

2012 Basin Highlights Report

Other Highlights

Even in the face of the drought, the Clean Rivers Program and programs that rely on CRP data continued to make strides in 2011.

TCEQ Watershed Action Planning

The TCEQ has implemented Watershed Action Planning. This process helps the TCEQ coordinate, document and track activities and strategies for protecting and improving water quality. The TCEQ worked with the Texas State Soil and Water Conservation Board and CRP partners from across the state to develop the Watershed Action Planning strategy table which lists impaired and special-interest water bodies, the recommended strategies for addressing the problems or issues, the status of each strategy and the lead agency or program for tracking.

Water bodies of special interest are those that are not considered “impaired” by state standards, but are of concern to local agencies. This list will be used by TCEQ to help focus funding and other resources. Two water bodies in our region – Lake Creek and Lake Conroe – while not impaired, show deteriorating conditions, and at H-GAC’s request, TCEQ added them to the list. H-GAC plans to start a watershed protection plan (WPP) project on Lake Creek when funds are available. The San Jacinto River Authority – Lake Conroe Division has started a WPP for Lake Conroe and can also use funds that may become available now that these two water bodies have been added to the list.

Bacteria Implementation Plan

In August 2011, the Bacteria Implementation Group approved the Bacteria Reduction Implementation Plan (I-Plan) for the Houston-Galveston Region to submit to

the TCEQ for consideration and possible approval and support. More than 90 local governments, professional organizations, and environmental groups have passed formal resolutions of support or otherwise indicated support for the I-Plan.

The I-Plan, developed over three years, includes 34 implementation activities and four research priorities to address eleven strategies to reduce the amount bacteria entering impaired waterways in the project area. The project area is roughly 2,204 square miles, has a population of about four million people, and encompasses all or part of ten counties and 56 cities.

H-GAC calculated the seven-year averages for E. coli levels at 345 monitoring stations in the project area and determined that 63% had levels higher than the state standard for contact recreation. Data suggests bacteria levels are increasing at 13 of the sites and decreasing at 29 of the sites. Among the ten stations with the highest bacteria, concentrations at three sites are decreasing.

H-GAC is working with local governments to share information about the stations that have the highest bacteria levels in the region. Local governments are examining water quality data as well as complaint and violation data. The local governments are also conducting visual investigations and additional sampling to try to identify the source(s) of bacteria at each of the sites. For the sites that are at the most upstream portion of the waterway, preliminary investigations suggest that grease blockages may be contributing to sanitary sewer system overflows into the storm drains. It may take several months or more to determine the primary sources of bacteria, and longer in other sites with upstream contributions.

WRIM, How's the Water App.

In 2011, H-GAC's CRP updated the Water Resources Information Map to make it easier to query, provide more information, including data summaries, current assessments and more data points. In January 2011, 84 unique users visited the mapping resource. Typical users for this interactive tool are water quality professionals, students working on research or class projects, instructors and professors, and water quality volunteers. (www.h-gac.com/go/wrim) This year, we also released our How's the Water iPhone app to give users on the go a snapshot of water quality, as well as the locations of water quality monitoring sites in their vicinity. Visit <http://www.h-gac.com/go/cemobilegis> or log on to the iTunes store and search for "How's the Water?"



Photo by Kristi Corse

Figure 5-12 Example Program Update Page 9



Photo by Kristi Corse

When considering water quality, rainfall can be a double-edged sword. The region needs rain to fill reservoirs and waterways, and to support aquatic life. A slow, moderate rainfall is ideal, allowing water to soak into the ground. Torrential downpours and isolated thunderstorms cause many waterways to overflow their banks while carrying high concentrations of bacteria, heavy sediment, and other unknown pollutants to downstream waterways and, eventually, Galveston Bay.

Only time will tell if the 2011 Drought will have a significant long-term effect on water quality in the Houston-Galveston Region or if it will simply be an outlier of information like other extreme weather events. The H-GAC Clean Rivers Program will continue to work with partners to monitor water quality in the region, report those findings to area residents, and work to help develop solutions for the problems we find.

This report was prepared in cooperation with the Texas Commission on Environmental Quality under the authorization of the Texas Clean Rivers Act.





Exhibit 5D. Basin Summary Report Outline

Outline

Executive Summary

The Executive Summary is intended to be an informative digest of the significant content and conclusions of the report. It is meant to be intelligible by itself, summarizing the purpose, findings, conclusions, and recommendations. The following is an outline for this overview:

Activities and Accomplishments—Describe the successes of the program and how the basin objectives have been accomplished over the past five years. Discuss how efforts undertaken with regard to monitoring (i.e., level of effort), geographic data sets, prioritization of water quality issues, efforts to involve basin stakeholders, and public outreach endeavors, have provided a benefit to the public.

Significant Findings—Summarize the results of the data analyses (e.g., number of sites with high levels of nutrients, positive and negative trends, and any hits with toxics). Describe major water quality issues and the most likely reasons for the water quality conditions. Highlight water quality that appears to be improving and report on any actions that have been taken to improve water quality.

Recommendations—Include specific recommendations for each watershed and explain the basis for the recommendation. Describe how the findings from the data analyses will be used to focus resources in the next biennium.

Summary Report

1.0 Introduction

The Introduction will provide the reader with the purpose of the report and sufficient background to understand the scope of the Clean Rivers Program (CRP) and the information provided within the report. The introduction will also include subsections with the following general headings:

- CRP and basin goals and objectives.
- Coordination or cooperation with other basin entities.
- Descriptive overview of the basin's characteristics, including key factors influencing water quality.
- Summary of basin's water quality characteristics.

2.0 Public Involvement

This section describes basin efforts to promote public involvement in water quality issues. Planning agencies will summarize public information and education activities undertaken

and evaluate the success of these activities. The report will also identify and discuss any public outreach materials developed (e.g., pamphlets for septic tank maintenance, NPS pollution education).

The Steering Committee needs to be discussed fully in this section. This may include a general description of membership, how the committee functions, and typical topics that are discussed at the meetings. This section should define how the committee's input is incorporated in decisions for focusing CRP resources (e.g., special studies, adding sites, adding parameters).

This section also should include efforts to seek public input for prioritizing water quality issues and monitoring projects, including watershed protection plan and TMDL coordination efforts, review of stream standards, the State's Water Quality Inventory, and basin planning initiatives. Where applicable, include a discussion on volunteer environmental monitoring groups and the function of these groups.

If any watershed-based technical sub-committees have been formed, a short overview of the functionality of those committees should be provided. A more in-depth discussion of how a committee has been involved in a special study can be provided in the Watershed Summaries section of this report.

3.0 Water Quality Review

Water Quality Terminology

This section needs to provide a description of any technical terms, including monitoring parameters and how they relate to maintaining water quality standards. A short discussion of the quality controls behind the data should also be included.

A table with parameter descriptions can be found in Exhibit 5G.

Data Review Methodology

This section will include a discussion of the methods used to evaluate the data and should provide enough detail for the reader to be able to re-create the steps. Some of the process overviews include:

- An explanation of TCEQ's assessment methodology, along with how the State's information will be used in the report.
- A discussion of the methods used to conduct the trend analysis specifying the parameters used to screen the data (e.g., number of records, period of record) and the criteria used to determine whether a trend exists (e.g., percent change per parameter).
- An explanation of any additional evaluation methods (e.g., compare descriptive statistics from site to site for similar watersheds to determine the relative level of

concern; compare descriptive statistics upstream to downstream to find significant changes, then relate factors in the watershed to the change).

- A description of the index of biotic integrity used for biological surveys.

See Exhibit 5E for specific steps for conducting the data analysis. These represent the minimum requirements for data analysis; analysis should be at least as robust as described in the Exhibit 5E. Any deviations from the minimum requirements must be communicated to the TCEQ CRP project manager for approval prior to submission of the pre-draft watershed summary.

Watershed Summaries

The review of water quality data and watershed characteristics should be presented within the context of a watershed to keep information for stations that are in close geographic proximity and subject to similar watershed characteristics together. For our purposes, a watershed is typically defined by a segment and the land and tributaries that drain to it. The following information will make up each watershed summary (see Exhibit 5F for an example watershed summary) and will help answer the questions:

- What are the water quality issues?
- Why do the issues exist?
- What are the possible effects?
- What should or could be done about it?

What are the Water Quality Issues?

The first step in the review of water quality is to identify water quality issues. A water quality issue may be identified in one or more of the following ways:

- Listed as an impairment or concern on the latest TCEQ Water Quality Integrated Report (e.g., Impaired or of concern because eight samples out of 28 collected over the past five years were over the criteria or screening level.)
- Local concern of stakeholders.
- Through the data analysis (see Exhibit 5E for data analysis steps) conducted by the planning agency (e.g., The eight samples were three times higher than the criteria or screening level; the trend analysis indicates a significant upward trend, and concentrations are getting close to the criteria or screening level; this water body exhibits the third highest median concentration of the parameter in the central watershed over the past five years.)

Note: In those cases where there is no “identified water quality issue”, the report needs to include some discussion of water quality. The discussion should include an overview of the watershed characteristics, results from the latest TCEQ Water Quality Integrated Report, and

the descriptive statistics (e.g., percentiles) to show how they compare to other similar water bodies in the area.

Next, for identified water quality issues, a description of the findings from a data analysis is needed to lay the groundwork for understanding the status of water quality. This will be a discussion based on the data analysis (see Exhibit 5E for the data analysis steps) conducted to determine if any trends exist, and how other corollary factors, such as flow or another parameter, are influencing water quality conditions.

Why Do the Issues Exist?

Once a water quality issue has been identified and defined, a description is needed explaining the possible reason(s) it is an issue (e.g., what is causing the problem) to improve overall understanding of the issue and its relative importance. The following is example text for this type of explanation:

- Rapid urban development bringing additional land application of fertilizers, pesticides, pet waste, septic systems, and new sewage outfalls, which can result in increased concentrations of nutrients, bacteria, and organic constituents in the water body.
- Large areas of cropland involving tillage, and the use of fertilizers and pesticides, which can result in increased sediment loads to the water body, as well as nutrients and organic constituents from the fertilizers and pesticides.
- Wildlife waste which can add bacteria and nutrients.
- Low flows, combined with pollution sources, do not provide adequate assimilative capacity.
- A review of the flows related to the eight elevated samples shows a direct correlation to rainfall and run-off, indicating that nonpoint sources are more likely to cause concentrations to exceed criteria, although base-level concentrations are somewhat elevated pointing to some influence from wastewater outfalls.
- A review of the water quality upstream and downstream of the site shows a decline from upstream to downstream possibly due to increased spring flows and distance from the rapid urban development in the upper portion of the watershed.

Note: A set of base maps showing the relationship of watershed characteristics with water quality conditions must be included in each watershed summary. The maps need to be at a suitable scale and contain an appropriate amount of detail, such as: water bodies with labels, major roads with labels, sampling sites with labels, counties and cities, segment boundaries, locations of water quality issues and factors influencing water quality.

What are the Possible Effects?

An explanation about how the water quality issue will affect the uses of the water body is important to determining the relative importance of the issue. Some examples for the possible effects of the water quality issue include:

- The increased sedimentation can reduce the survivability of aquatic life and reduces the aesthetic use of the stream.
- When flows increase after a rain event, the stream may not be suitable for swimming because bacteria concentrations increase by up to five times the state-established criteria.
- Nitrate concentrations at levels above 10 mg/L are considered too high for drinking water use, and levels above 30 mg/L are shown to have a negative impact on aquatic life in the stream.
- EPA has stated that perchlorate can cause developmental problems in children if consumed in drinking water.

What Should or Could be Done About It?

A discussion of the “next steps” that need to be taken to reduce the impact of the water quality problem will help in setting future priorities for monitoring and strategies for improvement. Some examples of possible next steps to addressing a water quality issue include:

- Continue the planning agency’s supporting or technical role in the ongoing watershed protection plan.
- Enhance stormwater controls for rock quarry operations.
- Work with local farmers to find an alternative to the use of atrazine.
- Obtain support for the regional wastewater treatment plan from local municipalities, developers, and county government.
- Conduct a special study to include two biological surveys including 24-hour dissolved oxygen measurements, target monitoring to run-off events as well as non-run-off events and monitor monthly for two years at five sites in the watershed at locations near potential sources.

Evaluation of Biological and Toxics (Organics, Metals) Data

The information developed from biological surveys should be incorporated into the water quality review to complement the findings from the water quality data. A comparison of the latest results to any previous results should be included to provide a long-term view of the information.

For toxics data compare the results to water quality standards and maximum contaminant or screening levels and describe the relevance of the findings.

4.0 Recommendations and Conclusions

Recommendations and Comments

While watershed-specific recommendations should be made in the watershed summaries (see Exhibit 5F for a watershed summary example), this section needs to include recommendations and comments made by stakeholders who reviewed the draft Basin Summary Report. In addition, an outline of the programmatic, regulatory, and legislative recommendations to protect and improve water quality throughout the basin need to be discussed. These recommendations may include a consideration of resources available for implementing the action.

The results of the analyses for this report, as well as input from stakeholders, should be used to set some preliminary priorities for addressing water quality issues. These priorities will help define where additional analysis may be needed. This will also help determine where additional information could be collected under the next biennium's work plan.

Conclusions

The report concludes with a discussion of how the planning agency's efforts have advanced the understanding of water quality. Also, this section will describe the planning agency's long-term vision of how basin efforts need to be directed during the next biennium to improve water quality.



Exhibit 5E. Data Analysis Steps (for the Basin Summary Report Watershed Summaries)

Instructions: These steps are the minimum requirements to evaluate water quality data, identify trends, and describe water quality conditions.

1. **Divide the basin into manageable sections (watersheds or segments)**
2. **Review the data and describe the water quality conditions**
 - (a) **Graph the Priority Parameters** (see Exhibit 5G for a list)
 - (1) Graph data for all segments whether or not they have an impairment (this will help in describing water quality).
 - (2) Graph data over time and include related parameters to help describe any correlations (especially flow).
 - (b) **Run a Trend Analysis**
 - (1) If there is enough data (>9 years, >19 records, consistent sampling with no significant data gaps), run a regression against time and describe the results (trend is significant with $t\text{-ratio} = \text{or} > |2|$, $p\text{-value} < 0.1$).
 - (2) If more than 50% of the samples in the dataset are censored, do not apply a trend analysis.
 - (c) **Include Graphs for Identified Water Quality Issues**
 - (1) Put graphs in the report for water quality issues that will benefit from a visual representation (especially for impairments, concerns, major exceedances, and other significant issues).
 - (d) **Describe the Water Quality Shown on the Graphs** (whether you include the graphs in the report or not).
 - (1) Describe the range (variability).
 - (2) Explain any measurements that do not meet criteria or screening levels.
 - (3) Does water quality vary with flow?
 - (4) Is there a seasonal component?
 - (5) What percent of the data exceeds the screening level for the past seven years? Is it a concern or an impairment?
 - (6) Is a change in data over time visible?
 - (7) Is there any corollary information to explain the effect of the issue (e.g., how do other related parameters vary)?

Tips for Conducting the Data Analysis

1. Pull all data for sites in the basin that provide a good representation of a water body. In some cases, more than one site will be needed to adequately represent a water

body. Associate flow with every record, and in reservoirs, get information on releases or inflow if available.

- (a) Put the data for each watershed into a spreadsheet (Station, Date, Time, Depth, Parameter code, greater than, less than, and value) for all data. Select stations based on longevity, significance, and coverage. (If there are stations that are very close to each other, then you may want to select one over the other. If there are significant differences in the data, or known influences between the two sites, it may be necessary to keep both.)
- (b) In some cases, if one station was dropped and a different one was picked up nearby, you will need to add those data sets together to achieve a longer data set; however, do not overlap data for the same period of record, since we do not want to double count data that may skew the results (e.g., data on the same day, data during the same month, more data in one month, quarter, or year than in others).

2. Prepare the data for graphing and analysis.

- (a) Sort the data by parameter code, station, and date.
- (b) Check for data that may need to be combined (e.g., put on the same graph) to lengthen the period of record (be careful not to double-up within a time period). For instance, nitrates have several different, yet comparable parameter codes (00593, 00620, 00621, 00630, 00631), orthophosphate phosphorus has two (00671 and 70507), *E. coli* has at least two (31648, 31699), and chlorophyll-*a* has at least two (32211, 70953).
- (c) Consider converting specific conductance to total dissolved solids (let the reader know you have done this).
- (d) If there are questions about how to use censored data, please contact the TCEQ CRP project manager.
- (e) In most cases, it will be necessary to transform the bacteria data by taking the log of that data prior to performing any type of regression analysis.

3. Graph the data for each significant parameter over time (nitrate, phosphorus, DO, pH, bacteria, total dissolved solids, total suspended solids, ammonia, chlorophyll-*a*)

- (a) Use a graph template and plot flow with the parameter whenever possible.
- (b) Check the scale to see if it needs to be adjusted. There may be a few high values that cause all the low values to be unrecognizable. Use some judgment as to where you should draw the line but be as consistent as possible for each parameter.
- (c) Values determined to be outliers may be considered for omission from the graphs.



- (d) If the data set is very long, and the earlier years do not show anything significant, consider plotting only the last 15-20 years of the data set. Be consistent on period of time.
- (e) Be sure to plot the criteria or screening level on the graphs.



Exhibit 5F. Example Watershed Summary (Example for the Basin Summary Report)

Water Quality Issues Summary

Table 5-4 is an example of content for explanations of water quality issues and possible solutions or actions to be taken. Figures 5-13 through 5-27 show examples of watershed summaries from CRP partner Basin Summary Reports.

Table 5-4. Explanations of Water Quality Issues and Possible Solutions

| Water Quality Issue | Affected Area | Possible Influences and Concerns Voiced by Stakeholders | Possible Effects | Possible Solutions and Actions Taken |
|---|--|--|--|---|
| Impairment for <i>E. coli</i> on 2022 Water Quality Inventory | Upper and lower portion of the watershed | Rapid urbanization, impervious cover Construction stormwater controls failing Developments with septic tanks or small, privately-run wastewater treatment plants Small, slow-moving stream with little assimilative capacity illegal dumping at creek crossings | Increased quantity of stormwater scouring stream beds, creating additional sediment loading and urban-related pollutants Bacteria load from land use and effluent is not reduced by instream flow Significant primary contact recreation 1 (e.g., swimming) could lead to gastrointestinal illnesses | Improve stormwater controls in new developments Adequate construction oversight Wastewater regionalization to prevent multiple small package plants and reduce septic tanks See Response to Concerns |
| Elevated ammonia-N | Upper portion of watershed | Wastewater treatment plants | Detrimental effect on aquatic biological community | Improve wastewater treatment plant operations |

| | | | | |
|--|---------------------------------------|---|---|--|
| <p>Concern for nutrient enrichment (nitrates and phosphorus)</p> | <p>Entire watershed</p> | <p>Wastewater treatment plant effluent</p> <p>Spring water high in nitrates from geology of aquifer formation</p> <p>Row-crop agriculture</p> | <p>Can increase production of algae causing an aesthetic nuisance</p> <p>Can cause significant swings in dissolved oxygen, affecting viability of aquatic life</p> <p>In moderate amounts, can actually enhance the fish population</p> | <p>If dissolved oxygen swings are significant and biology shows a related effect, then some phosphorus controls may be needed for wastewater treatment plants</p> <p>Water golf courses and other open areas with effluent may actually reduce water quality due to reduced flows instream</p> |
| <p>Stakeholder concern for oil and gas operations</p> | <p>Lower portion of the watershed</p> | <p>Recent increased oil and gas activity</p> <p>Historical stakeholder accounts indicate sheens in 70s and 80s, but not today</p> | <p>Detrimental effect on biological community</p> <p>Drinking water polluted with organic oil field by-products</p> <p>Contact recreation use could lead to illnesses</p> | <p>River authority sampled two sites, twice, and found no detection of related pollutants</p> |
| <p>Decreasing trend for total phosphorus</p> | <p>Lower portion of the watershed</p> | <p>Reduction in wastewater treatment plant effluent</p> <p>Unknown</p> | <p>Reduction in algae production instream</p> <p>Reduction in diurnal swings in dissolved oxygen, reducing stress on aquatic biology</p> | <p>Re-use of wastewater treatment plant effluent during dry, low-flow periods</p> |

Figure 5-13. Example Watershed Summary #1 Page 1

GUADALUPE RIVER BELOW FLAT ROCK DAM

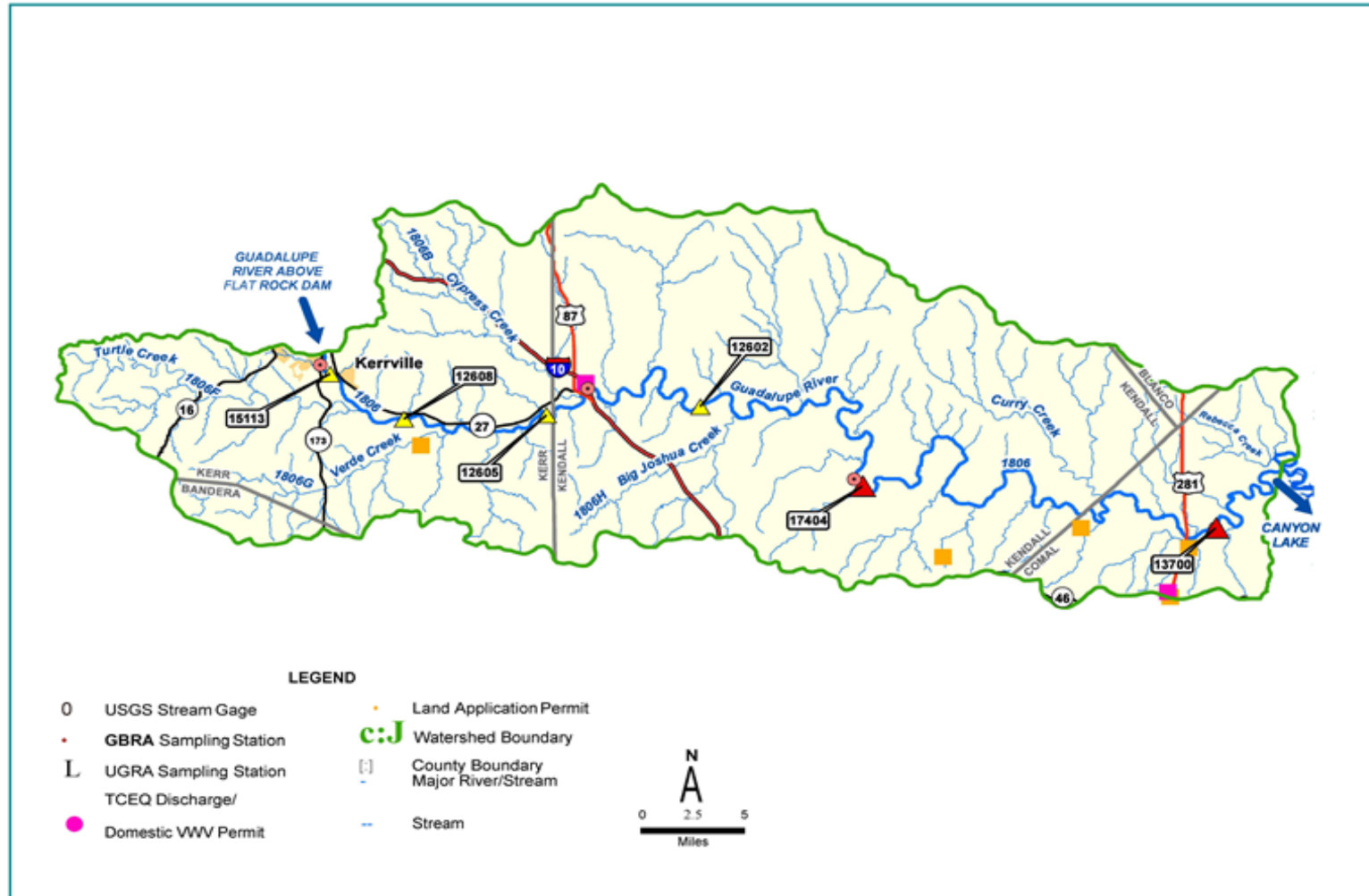


Figure 5-14. Example Watershed Summary #1 Page 2

GUADALUPE RIVER BELOW FLAT ROCK DAM

Segment 1806 comprises the 103 mile portion of the Guadalupe River that flows from the confluence between the North Fork and South Forks in Kerr County to Canyon Reservoir in Comal County. This summary report will discuss this segment as two sub-watersheds in order to better describe the effects of a Total Maximum Daily Load (TMDL) implementation plan that has been put into place upstream of Flat Rock Dam in the City of Kerrville. The TCEQ has divided this segment into eight assessment units (AUs). The three AUs that describe the lower sub-watershed below Flat Rock Dam are 1806_02 from the confluence with Big Joshua Creek to Flat Rock dam in Kerrville, 1806_08 from the confluence with Honey Creek upstream to the confluence with Big Joshua Creek and 1806_01 which covers the lower 2.5 miles of segment from 1.7 miles downstream of Rebecca Creek Road up to the confluence with Honey Creek. These three AUs represent over 93% of the total river reach for this segment. For information regarding the remaining five AUs in this segment please refer to the section of this report covering the Guadalupe River above Flat Rock Dam.



In 2002, segment 1806 was listed on the Texas 303(d) list of impaired waterbodies, as required by Clean Water Act Sections 303(d) and 305(b). The TCEQ found that two assessment units 1806_06 and 1806_04 in the City of Kerrville had bacteria levels that exceeded the primary contact recreation standard geometric mean of 126 colony forming units of E. coli

per 100 ml (CFUs/100mL) of water. Please see the section of this summary report regarding the upper sub-watershed above Flat Rock Dam for a more in depth discussion of the resulting TMDL study that was accepted by the EPA in 2007 and implementation plan that was put into place in 2011. In 2008, AU 1806_08 in the lower sub-watershed was also found to be in non-support

of the primary contact recreation standard. An assessed E. coli geometric mean of 140 most probable number per 100 ml (MPN/100 ml) of water was identified downstream of Big Joshua Creek in Kendall County. This new impairment was included into impairment category 4a at this time, because the TMDL reach covered the entire segment.

In the most recently approved 2014

Texas Integrated Report of Surface Water Quality, Segment 1806 of the Guadalupe River is no longer listed as impaired for contact recreation. The data from that report revealed that the geometric means of E. coli data from all eight AUs of this segment are now fully supporting primary contact recreation standards.

CONTINUED ON PAGE 30

Guadalupe River below Flat Rock Dam

Drainage Area: 827 square miles

Streams and Rivers from Flat Rock Dam to Canyon Lake: Silver Creek, Turtle Creek, Steel Creek, Verde Creek (1806G), Bluff Creek, Cherry Creek, Bruins Creek, Wilson Creek, Cypress Creek (1806H), Holliday Creek, Flat Rock Creek, Block Creek, Joshua Creek (1806H), Violet Creek, Sister Creek, Jacobs Creek, Wasp Creek, Bear Creek, Sabinas Creek, Goss Creek, Spring Creek, Swede Creek, Panther Creek, Walter Creek, Honey Creek, Curry Creek, Spring Branch, Swine Creek, Elm Creek, Cypress Creek, Miller Creek

Aquifer: Trinity, Edwards Plateau

River Segments: 1806

Cities: Center Point, Comfort, Kendalia, Bergheim, Bulverde, Spring Branch

Counties: Kerr, Comal, Kendall, Blanco

EcoRegion: Edwards Plateau

Climate: Average annual rainfall 31.68 inches, Average annual temperature January 38 °, July 95 °

Vegetation Cover: Evergreen Forest 30.7%; Deciduous Forest 7.0%; Shrubland 48.8%; Grassland: 9.6%; Cultivate Crops 0.4%; Pasture Hay 0.4%

Land Uses: urban, unincorporated suburban sprawl, cattle, goat and sheep production, light and heavy industry, and recreational

Development: Low Intensity 0.5%; Medium Intensity 0.2%; High Intensity 0.1%; Open Space 2.3%

Water Body Uses: aquatic life, contact recreation, general use, fish consumption, and public water supply

Soils: Dark and loamy over limestone to loam with clay subsoils

Permitted Wastewater Treatment Facilities: Land Application 6, Domestic 1

Figure 5-15. Example Watershed Summary #1 Page 3**GUADALUPE RIVER BELOW FLAT ROCK DAM**

In the 2014 Integrated Report, the AU 1806_08 geometric means dropped to a concentration of 109 MPN/100 L and were removed from the 303(d) list. The TMDL process and associated watershed protection and stewardship activities were focused on the AUs upstream of Flat Rock Dam, near the City of Kerrville. The TMDL may have contributed to the recovery of this stream segment, none of the TMDL activities were directly targeted at the impairment on AU1806_08. The majority of the BMPs that were implemented in this segment were focused on the urban areas immediately surrounding the city of Kerrville and therefore unlikely to directly affect this rural AU. The diminished E. coli concentrations in this AU may have been more profoundly affected by the

extended drought that began in 2008. The reduced non-point source runoff associated with these drought years corresponded with several years of lower E. coli concentrations, which proved to be beneficial to the assessment of this segment. Unfortunately, as rainfalls and stream flow have begun to rise out of drought levels, the bacteria geometric mean in this AU has also begun to increase.

Assessment Unit 1806_02 represents a -32 mile reach between Big Joshua Creek in Kendall County upstream to the Flat Rock Dam in Kerr County. This AU falls in the transition area between the portion of the watershed that is managed by the UGRA and the watershed downstream of Kerr County, which is managed by the

GBRA. There are two USGS gages located in this AU, two miles downstream of Flat Rock Dam and downstream of the City of Comfort. The UGRA performs routine sampling at four stations within the AU. The most upstream monitoring station located on this AU is 15113, which is located off Split Rock Road near SH 27, -1.5 miles downstream of Flat Rock Dam and Kerrville Lake. A regression analysis of the data from June of 2003 to December of 2016 revealed several water quality trends at this station. This station has experienced an increase in specific conductance (TDS is calculated from this measurement), an increase in pH, and a decrease in Total Suspended Solids (Figures 1 & 2 & 3). Although no significant correlations with stream flow

were noted for these parameters, stream flow was significantly decreasing overtime and the changes in these parameters were most likely due to prolonged drought conditions. This station also has the lowest E. coli geometric mean in the AU, with a concentration of 22 MPN/100 ml. The excellent water quality (Table 1) at this station, including the diminishing suspended sediments and exceptional bacteria values may be due to the proximity of this station to active best management practices associated with the TMDL implementation plan that have been put into place immediately upstream. The only concern in this segment is for biological habitat. Two aquatic life monitoring events were performed in 2012 and 2014, which scored the biological habitat below the "excellent" designation for this water body. These scores were partially depressed due to low flow conditions during aquatic life monitoring, likely as a result of several years of drought. The next downstream station in this AU is 12608, which is located at Center Point Lake, -5.1 miles downstream of Split Rock Road. The only statistically significant observation that could be made at this station was that stream flow was diminishing over time, just as in the other stations in this AU (Figure 4). The 62 MPN/100 ml geometric mean of E. coli at this station was slightly higher than any other station in this AU. This value was most likely slightly elevated due to depositions from water fowl on Center Point Lake. The next downstream



Figure 5-16. Example Watershed Summary #1 Page 4**GUADALUPE RIVER BELOW FLAT ROCK DAM**

monitoring location is station 12605, which is located just upstream of the Kerr County line at the Hermann Sons Road crossing of the Guadalupe River. This station is located -8.4 miles downstream of Center Point Lake. An analysis of the data from this station over the same time period as the other stations in this AU has revealed several trends. A significant reduction in flow over time (Figure 5) and an increase in sulfate over time (Figure 6) have been documented at this station. The sulfate trend at this station was not statistically correlated with changes in stream flow, but the similar chloride anion did inversely correlate with stream flow. The geometric mean concentration of 44 MPN/100mL of E.coli at this station was even lower than in the Center point station upstream. The average annual streamflow recorded at USGS gage near this this monitoring station for the period of data examined was 194 cfs. The next station is the only routine monitoring station in this AU located outside of Kerr County. This station 12602 is located near the FM 1621 bridge in the town of Waring -16.4 miles downstream of the Kerr County line. This monitoring station is downstream of the only permitted wastewater discharge in this AU. The Kendall County Water Control and Improvement district is permitted to discharge up to 0.35 million gallons per day of treated wastewater into the Guadalupe River below the city of Com fort. This wastewater is treated to a high level with permit limits of 5 mg/L of Biochemical Oxygen Demand (BOD), 5

mg/L of TSS, 2 mg/L of Ammonia Nitrogen and 1 mg/L of Total Phosphorus. Much of this wastewater is reused for irrigation of a local golf course, since a Texas Administrative Code Title 30 Chapter 210 authorization for beneficial use was granted by the TCEQ in 2002. A regression analysis revealed one trend over time. The chloride anion concentration was found to be significantly increasing over time (Figure 7). A significant correlation with flow was not observed for chloride. Water quality parameters at this station were within normal assessment criteria and met all designated uses (Table 4). Although this station is positioned immediately upstream of a previously assessed E.coli impairment on AU 1806_08, the geometric mean for E. coli always remained well below the primary contact recreation standard. The E. coli geometric mean at the Waring monitoring station is currently 49 MPN/100 ml for all data available.

Assessment Unit 1806_08 is located immediately upstream of the confluence with Honey Creek in Comal County and comprises a reach of approximately 39 miles upstream to the confluence with Big Joshua Creek in Kendall County. This AU flows northeast of the City of Boerne and is frequently used for contact recreation and fishing activities. The only monitoring station in this AU is station 17404, which is located on the Guadalupe River upstream of the FM 474 Bridge in Kendall County. Station 17404 has been monitored quarterly by the GBRA since 2001. The E. coli data



collected from this station was used to assess the 140 MPN/100 ml geometric mean and resulting 303(d) listing for non-support of the 126 MPN/100 ml primary contact recreation standards in 2008. This AU was included into category 4a with the other impaired AUs on this stream segment, due to the existence of the TMDL that was approved in 2007. The land use for this AU differed significantly from the other impaired AUs included in the segment 1806 TMDL and no BMPs were specifically targeted at this area as a part of the TMDL implementation

plan. This AU is much more rural and has a greater potential to be influenced by agricultural runoff than the urbanized AUs upstream in the city of Kerrville. Only one permitted discharge occurs in this AU, but it is located on a small tributary, whose confluence is -13 miles downstream of the monitoring station at FM 474. The effects of this discharge would be measured at station 13700 in the downstream AU. The data for station 17404 was reviewed from January of

CONTINUED ON PAGE 32

Figure 5-17. Example Watershed Summary #1 Page 5**GUADALUPE RIVER BELOW FLAT ROCK DAM**

2003 to December of 2016 to look for trends in water quality. Water quality trending was noted for several parameters at this station. The chloride and sulfate anions both appeared to be significantly increasing with time (Figures 8 & 9). Total Hardness appears to be significantly decreasing with time (Figure 10). All three of these trends are significantly correlated with stream flow. The chloride and sulfate levels both decrease as stream flow increases (Figures 11 & 12). Total Hardness increases as stream flow increases (Figure 13). These correlations seem to make sense as the anions are diluted by additional water in the system and more calcium carbonate is flushed out of the limestone of the surrounding Edwards Plateau during higher flow events. Although a significant correlation between stream flow and time was not noted for the data collected at this station, the effects of the multi-year drought, beginning in 2008, on stream flow have been identified at several other monitoring locations within segment 1806. At several stations outside of this AU, significant decreases in stream flow overtime have been noted (See Figures 4 & 5). The quarterly monitoring frequency for this particular monitoring station may have made identification of long term flow patterns more difficult due to the lower resolution of data collected, but flows at this station most likely followed similar patterns to other stations in the segment. The mean chloride level for this assessment unit was 23.3 mg.LL with a maximum value of 38.4 mg.LL.

The mean sulfate level was 24.8 mg.LL with a maximum value of 36.9 mg.LL. At no point did the concentrations of either chloride or sulfate anions exceed the 50 mg.LL general use screening criteria (Table 5). Although this station was removed from the 303(d) list for primary contact recreation in the 2014 Texas Water Quality Inventory, an analysis of all of the E. coli data collected to date reveals a long term geometric mean of 140 MPN/100 ml. By reducing the data to the 7 year periods that bracket each 2 year assessment several predications can be made. The 2016 assessment will cover a seven year period beginning in December of 2007 and ending in November of 2014. No significant trending pattern was found for E. coli at this station (Figure 14). An analysis of this data during the 2016 assessment period of record revealed that this AU will have a slightly higher geometric mean of 117 MPN/100 ml. If the 2018 assessment advances the data forward two more years then several years of low concentration data will be removed from the assessment. A preliminary analysis of the E. coli data from this period of record indicates a geometric mean of 146 MPN/100 ml which is greater than the contact recreation standard of 126 MPN/100 ml for this AU. This is primarily due to an abundance of higher E. coli concentrations in the years 2014 through 2016. These concentrations were most likely higher due to a greater amount of non-point source runoff resulting from higher rainfall totals

following the extended drought period.

The most downstream AU 1806_01 covers a 25 mile reach in Comal County from a point 1.7 miles downstream of Rebecca Creek Road upstream to the confluence of Honey Creek near the Kendall County line. This AU is represented by a single monitoring station 13700. Station 13700 is located on the Guadalupe River upstream of the FM 311 Bridge near the USGS gaging station in Spring Branch and has been monitored monthly by the GBRA since 1996. This segment of the Guadalupe River immediately upstream of Canyon Lake is a part of the Guadalupe River Paddling Trail and is known for clear water with abundant contact recreation. There are no known permitted discharges into this assessment unit. The 2014 Texas Integrated Report of Water Quality indicates full support of all designated uses and the geometric mean of E. coli was well below the primary contact reaction standard of 126 MPN/100 ml with a concentration of 62 MPN/100 ml. A review of the data from December of 2002 to November of 2016 was conducted at this station. The average stream flow at the nearby USGS gage during this time period was 362 cfs. Several important data trends were identified at this station. Much like the other stations upstream, stream flow at this station appears to be significantly declining (Figure 15). This trend is most likely due to several years of drought, beginning in 2008, including an extended period during from August till October

Figure 5-18. Example Watershed Summary #1 Page 6

GUADALUPE RIVER BELOW FLAT ROCK DAM

of 2011, when the stream flow at this station was measured at 0.00 cfs and the river was reduced to unconnected pools of water. A significant increase in chlorides and sulfates over time was also identified at this station (Figure 16 & 17). These rising chloride and sulfate levels can be at least partially explained by the overall reduction in streamflow, because chlorides are significantly increasing as stream flow decreases (Figure 18). Although the concentrations of these anions appear to be increasing, at no point did any value exceed the stream general use screening criteria of 50 mg/L. All of the available data shows that this station appears to support the AU's designated uses (Table 6). The geometric mean of E. coli at this station remains at 64 MPN/100 ml with a maximum recorded value of 2400 MPN/100 ml. The average concentrations measured for all water quality parameters fall within the designated use criteria for this segment.



Table 1
Station 15113 - Guadalupe at Spilt Rock Road 02/2003 - 12/2016

| Parameter | AU 1806_02 General Use | | | # of Measurements | Screening Criteria |
|-------------------------------|------------------------|---------|---------|-------------------|----------------------------------|
| | Mean | Maximum | Minimum | | |
| Temperature (°C) | 21.8 | 30.0 | 9.8 | 65 | 32.20 |
| pH(S.U.) | 8.1 | 8.5 | 7.8 | 64 | 6.5-9.0 |
| Chloride | 26.4 | 45.1 | 17.8 | 55 | 50.00 |
| Sulfate | 17.1 | 23.8 | 10.8 | 55 | 50.00 |
| Total Dissolved Solids (mg/l) | 316 | 378 | 268 | 64 | 400.00 |
| NH3-N (mg/l) | N/A | N/A | N/A | N/A | 0.33 |
| Total Phosphorus (mg/l) | <0.04 | 0.08 | <0.04 | 55 | 0.69 |
| Chlorophyll-a (pg/l) | <1.0 | 13.3 | <1.0 | 54 | 14.10 |
| Nitrate Nitrogen (mg/l) | 0.63 | 1.4 | <0.04 | 52 | 1.95 |
| TKN (mg/l) | 0.41 | 0.71 | <0.2 | 21 | N/A |
| AU 1806_02 Recreational Use | | | | | |
| E. coli (MPN/100ml) | 23 Geomean | 120 | <1 | 54 | 126 Geomean |
| AU 1806_02 Aquatic Life Use | | | | | |
| Dissolved Oxygen | 9.5 | 14.2 | 5.5 | 64 | I: 4.0 Minimum & II: 6.0 Average |

Table 2
Station 12615 - Guadalupe at Center Point 02/2003 - 12/2016

| Parameter | AU 1806_02 General Use | | | # of Measurements | Screening Criteria |
|-------------------------------|------------------------|---------|---------|-------------------|----------------------------------|
| | Mean | Maximum | Minimum | | |
| Temperature (°C) | 21.7 | 31.5 | 9.1 | 73 | 32.20 |
| pH(S.U.) | 8.0 | 8.4 | 6.6 | 73 | 6.5-9.0 |
| Chloride | 26.2 | 45.6 | 16.0 | 55 | 50.00 |
| Sulfate | 22.5 | 32.0 | 14.9 | 55 | 50.00 |
| Total Dissolved Solids (mg/l) | 322 | 385 | 267 | 73 | 400.00 |
| NH3-N (mg/l) | N/A | N/A | N/A | N/A | 0.33 |
| Total Phosphorus (mg/l) | <0.04 | 0.15 | <0.04 | 55 | 0.69 |
| Chlorophyll-a (pg/l) | <1.0 | 8.6 | <1.0 | 54 | 14.10 |
| Nitrate Nitrogen (mg/l) | 0.57 | 1.48 | <0.05 | 52 | 1.95 |
| TKN (mg/l) | 0.35 | 0.59 | <0.2 | 20 | N/A |
| AU 1806_02 Recreational Use | | | | | |
| E. coli (MPN/100ml) | 62 Geomean | 3500 | 5 | 144 | 126 Geomean |
| AU 1806_02 Aquatic Life Use | | | | | |
| Dissolved Oxygen | 8.5 | 8.4 | 6.6 | 73 | I: 4.0 Minimum & II: 6.0 Average |

Figure 5-19. Example Watershed Summary #1 Page 7

GUADALUPE RIVER BELOW FLAT ROCK DAM

Table3
Station 12605 - Guadalupe at Hennann Sens Road 02/2003 - 12/2016

| AU 1806_02 General Use | | | | | |
|-------------------------------|-----------|---------|---------|------------------|---------------------------------|
| Parameter | Mean | Maximum | Minimum | #of Measurements | Screening Criteria |
| Temperature (°C) | 20.9 | 29.4 | 9.4 | 56 | 32.20 |
| pH(S.U.) | 8.0 | 8.4 | 7.4 | 56 | 6.5- 9.0 |
| Chloride | 25.0 | 52.4 | 13.0 | 56 | 50.00 |
| Sulfate | 24.8 | 37.6 | 9.2 | 56 | 50.00 |
| Total Dissolved Solids (mg/l) | 330 | 379 | 275 | 56 | 400.00 |
| NH3-N (mg/l) | N/A | N/A | N/A | N/A | 0.33 |
| Total Phosphorus (mg/l) | <0.04 | 0.07 | <0.04 | 56 | 0.69 |
| Chlorophyll-a (pg/l) | <1.0 | 6.6 | <1.0 | 55 | 14.10 |
| Nitrate Nitrogen (mg/l) | 0.59 | 1.49 | <0.05 | 53 | 1.95 |
| TKN (mg/l) | 0.31 | 0.59 | <0.2 | 22 | N/A |
| AU 1806_02 Recreational Use | | | | | |
| Ec. col(MPN/100 ml) | 44Geomean | 520 | 5 | 55 | 126Geomean |
| AU 1806_02 Aquatic Life Use | | | | | |
| Dissolved Oxygen | 8.8 | 13.9 | 6.0 | 56 | II:4.0 Minimum & II:6.0 Average |

Table5
Station 17404 - Guadalupe at FM 474 NE of Boerne Data from 12/2002 - 11/2016

| AU 1806_08 General Use | | | | | |
|-------------------------------|------------|---------|---------|------------------|---------------------------------|
| Parameter | Mean | Maximum | Minimum | #of Measurements | Screening Criteria |
| Temperature (°C) | 19.6 | 29.0 | 8.4 | 56 | 32.20 |
| pH(S.U.) | 7.9 | 8.2 | 7.4 | 56 | 6.5- 9.0 |
| Chloride | 23.2 | 38.4 | 7.5 | 55 | 50.00 |
| Sulfate | 24.9 | 36.9 | 10.8 | 55 | 50.00 |
| Total Dissolved Solids (mg/l) | 348 | 408 | 180 | 56 | 400.00 |
| NH3-N (mg/l) | <0.10 | 0.35 | <0.10 | 55 | 0.33 |
| Total Phosphorus (mg/l) | <0.02 | 0.21 | <0.02 | 55 | 0.69 |
| Chlorophyll-a (pg/l) | <1.0 | 2.52 | <1.0 | 54 | 14.10 |
| Nitrate Nitrogen (mg/l) | 0.36 | 1.21 | <0.02 | 55 | 1.95 |
| TKN (mg/l) | <0.2 | 0.52 | <0.2 | 35 | N/A |
| AU 1806_08 Recreational Use | | | | | |
| Ec. col(MPN/ 100 ml) | 140Geomean | >4800 | 16 | 55 | 126Geomean |
| AU 1806_08 Aquatic Life Use | | | | | |
| Dissolved Oxygen | 9.1 | 14.8 | 5.7 | 56 | II:4.0 Minimum & II:6.0 Average |

Table4
Station 12602 - Guadalupe at FM 1621In Waring Data from 06/2003 - 12/2016

| AU 1806_02 General Use | | | | | |
|-------------------------------|-----------|---------|---------|------------------|---------------------------------|
| Parameter | Mean | Maximum | Minimum | #of Measurements | Screening Criteria |
| Temperature (°C) | 21.0 | 31.3 | 9.0 | 58 | 32.20 |
| pH(S.U.) | 8.1 | 8.6 | 6.7 | 58 | 6.5- 9.0 |
| Chloride | 25.4 | 40.4 | 13.0 | 57 | 50.00 |
| Sulfate | 26.5 | 37.0 | 14.0 | 58 | 50.00 |
| Total Dissolved Solids (mg/l) | 344 | 401 | 242 | 58 | 400.00 |
| NH3-N (mg/l) | <0.10 | <0.10 | <0.10 | 41 | 0.33 |
| Total Phosphorus (mg/l) | <0.02 | 0.09 | <0.02 | 56 | 0.69 |
| Chlorophyll-a (pg/l) | <1.0 | 3.37 | <1.0 | 54 | 14.10 |
| Nitrate Nitrogen (mg/l) | 0.61 | 1.61 | <0.04 | 53 | 1.95 |
| TKN (mg/l) | 0.23 | 0.8 | <0.2 | 54 | N/A |
| AU 1806_02 Recreational Use | | | | | |
| Ec. col(MPN/ 100ml) | 49Geomean | 2000 | <2 | 57 | 126Geomean |
| AU 1806_02 Aquatic Life Use | | | | | |
| Dissolved Oxygen | 9.3 | 12.6 | 6.7 | 58 | II:4.0 Minimum & II:6.0 Average |

Table6
Station 13700 - Guadalupe at FM 311In Spring Branch Data from 12/2002 - 11/2016

| AU 1806_01 General Use | | | | | |
|-------------------------------|-----------|---------|---------|------------------|---------------------------------|
| Parameter | Mean | Maximum | Minimum | #of Measurements | ScreeningCriteria |
| Temperature (°C) | 20.8 | 33.0 | 5.3 | 161 | 32.20 |
| pH(S.U.) | 8.0 | 8.5 | 7.5 | 161 | 6.5-9.0 |
| Chloride | 21.9 | 35.6 | 9.1 | 161 | 50.00 |
| Sulfate | 24.1 | 33.9 | 12.5 | 161 | 50.00 |
| Total Dissolved Solids (mg/l) | 339 | 644 | 275 | 161 | 400.00 |
| NH3-N (mg/l) | <0.10 | 0.95 | <0.10 | 80 | 0.33 |
| Total Phosphorus (mg/l) | <0.02 | 0.28 | <0.02 | 161 | 0.69 |
| Chlorophyll-a (pg/l) | <1.0 | 6.2 | <1.0 | 159 | 14.10 |
| Nitrate Nitrogen (mg/l) | 0.36 | 1.78 | <0.02 | 159 | 1.95 |
| TKN (mg/l) | <0.2 | 0.95 | <0.2 | 63 | N/A |
| AU 1806_01 Recreational Use | | | | | |
| Ec. col(MPN/ 100ml) | 64Geomean | >2400 | <2 | 161 | 126Geomean |
| AU 1806_01 Aquatic Life Use | | | | | |
| Dissolved Oxygen | 9.5 | 14.9 | 5.2 | 160 | II:4.0 Minimum & II:6.0 Average |

Figure 5-20. Example Watershed Summary #1 Page 8

GUADALUPE RIVER BELOW FLAT ROCK DAM

Figure 7

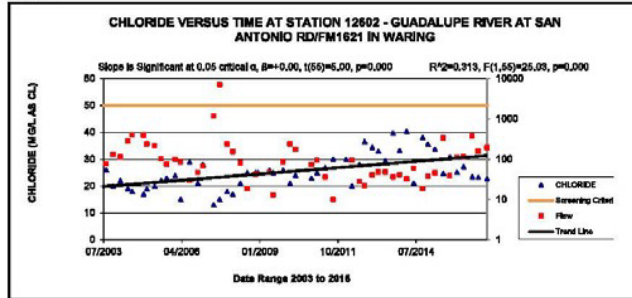


Figure 10

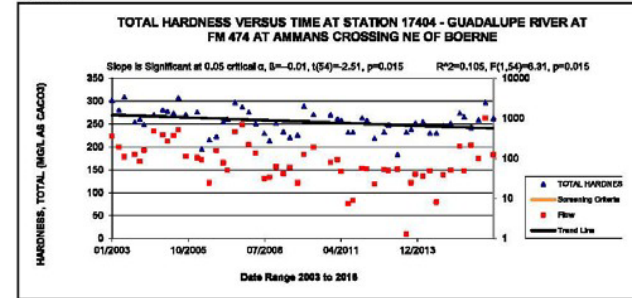


Figure 8

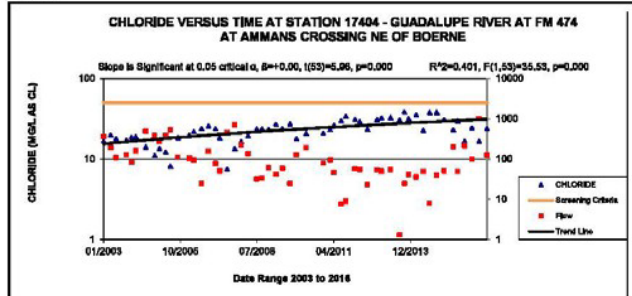


Figure 11

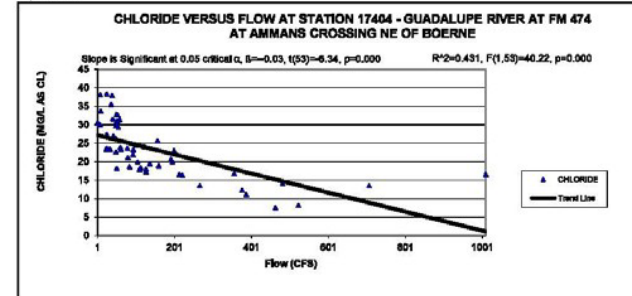


Figure 9

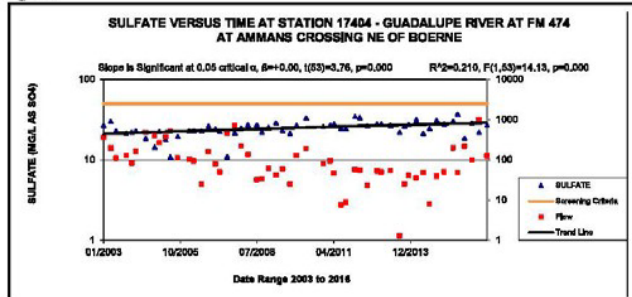


Figure 12

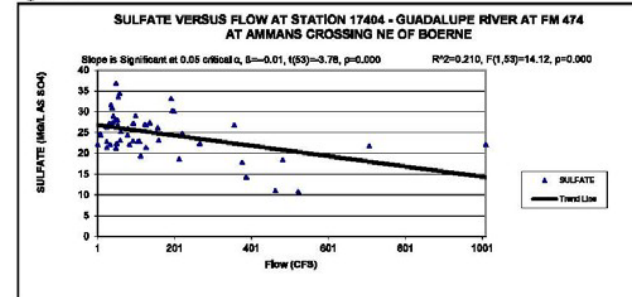


Figure 5-21. Example Watershed Summary #2 Page 1

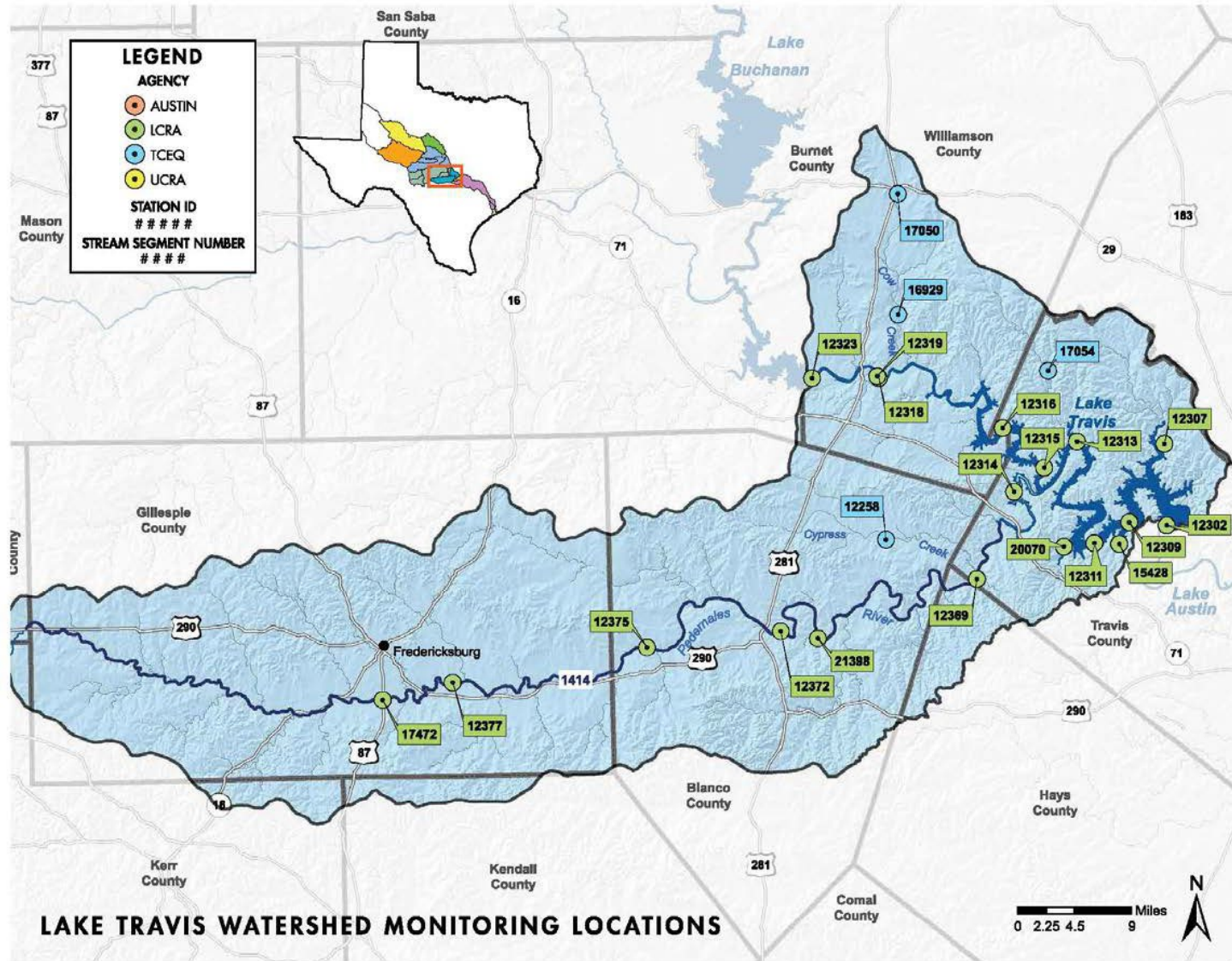


Figure 5-22. Example Watershed Summary #2 Page 2

LAKE TRAVIS WATERSHED

Twenty stations in the Lake Travis Watershed were monitored from 2006 to 2016.

- Segment 1404 – Lake Travis
- Segment 1405 – Lake Marble Falls
- Segment 1414 – Pedernales River
- Segment 1414B – Cypress Creek

Watershed Characteristics

Located in the Texas Hill Country, the Lake Travis watershed, including the Pedernales River and lakes Travis and Marble Falls, is approximately 1,830 square miles. The watershed lies within the Edwards Plateau, a region distinguished by rocky terrain and clear perennial streams. Growth and development have dramatically changed the landscape in the region over the past 20 years.

Lack of rainfall since 2008 lowered Lake Travis to levels not seen since the drought of record during the 1950s. Inflows to the Highland Lakes in 2013 were the second lowest on record; 2011 and 2008 were first and third, respectively. Lake Travis and other Central Texas lakes began to fill as a result of floods and increased rainfall in the region late in 2015 and into 2016.



Lake Travis

Figure 5-23. Example Watershed Summary #2 Page 3

SEGMENT SUMMARIES

Segment 1404 – Lake Travis

Mansfield Dam impounds Lake Travis on the Colorado and Pedernales rivers in western Travis County. The reservoir, which is about 18,929 surface acres, originally was designed to contain floodwaters. It is one of the clearest reservoirs in Texas and is a popular recreation destination.

Monitoring data from stations near Lakeway indicate a concern for low dissolved oxygen. First noted in the TCEQ 2010 Integrated Report, it is likely a result of lake mixing – a natural phenomenon that can cause dissolved oxygen levels to temporarily drop as cold, oxygen-depleted water rises from the bottom and mixes into the water column.

Trend analysis on Lake Travis showed an increase in salts in five of the nine water monitoring stations on Lake Travis. Chloride, sulfate or TDS concentrations trended higher at stations 20070, 12313, 15428, 12307 and 12302. The trend is a function of low lake levels during the drought as demonstrated by the decreasing values after significant rains raised lake levels in 2015 at Station 15428 (Figure 69). Values for each of the salt parameters remain well below the criteria at all stations.

*M - Meets water quality standard
C - Concern for water quality standard*

Station 15428 - Lake Travis at Hurst Cove

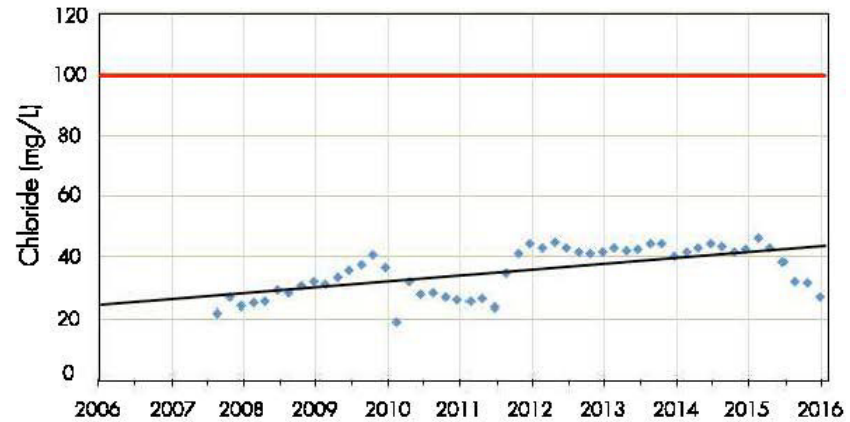


Figure 69. Chloride Trend / Lake Travis

| Station ID | Aquatic Life | | Recreation | General | | | | |
|------------|------------------|---------|------------|-------------|----|-------|-----------|-------------|
| | Dissolved Oxygen | Biology | Bacteria | Temperature | pH | Salts | Nutrients | Chlorophyll |
| 12302 | M | - | M | M | M | M | M | M |
| 12307 | M | - | M | M | M | M | M | M |
| 12309 | C | - | M | M | M | M | M | M |
| 12311 | M | - | M | M | M | M | M | M |
| 12313 | M | - | M | M | M | M | M | M |
| 12315 | C | - | M | M | M | M | M | M |
| 12316 | M | - | M | M | M | M | M | M |
| 15428 | M | - | M | M | M | M | M | M |
| 20070 | C | - | M | M | M | M | M | M |

Table 46. Summary of the 2014 Integrated Report / Llano River

Figure 5-24. Example Watershed Summary #2 Page 4

Mansfield Dam at Lake Travis / 2016

Colorado River Environmental Models

Ongoing LCRA initiatives to protect the lake include the Highland Lakes Watershed Ordinance and the Colorado River Environmental Models (CREMS). The watershed ordinance (see [B] Watershed Summary) manages nonpoint-source pollution around the lake, and CREMS is a modeling tool used to determine how various development scenarios impact water quality.

Stricter management of water supply and river flows, increasing pollution loads brought about by a growing population, and greater regulatory pressures all require sophisticated management and analysis of water data. CREMS is a system of integrated computer-based models and data sets developed to help LCRA manage the Highland Lakes and the lower Colorado River system. CREMS serves as part of a decision support system that facilitates decision-making for analyzing the water quality impacts of discharge permits, nutrient loading, stream and reservoir standards, water supply planning, implications of growth and development, and nonpoint-source pollution issues.

LCRA has used model outputs to help the cities of Burnet and Fredericksburg develop more protective discharge limits for their wastewater treatment plant and provided invaluable information that helped manage water supplies during the drought. LCRA will continue to develop the models as lake conditions change, and work with the Highland Lakes communities to develop reasonable treatment options that protect water quality. For more information on CREMS, visit lra.org/water/quality/water-quality-permit-review-program/pages/water-quality-models.aspx.

Figure 5-25. Example Watershed Summary #2 Page 5

Segment 1405 – Lake Marble Falls

Max Starcke Dam forms Lake Marble Falls on the Colorado River near the town of Marble Falls. With a surface area of 545 acres, it is the smallest reservoir in the chain of Highland Lakes.

All water quality standards were attained and no statistically significant trends were found for Lake Marble Falls.



Lake Marble Falls

M - Meets water quality standard

Segment 1414 – Pedernales River

The headwaters of the Pedernales River are located near Harper in Kimble County. The river flows east through Fredericksburg, Stonewall and Johnson City before reaching the mouth of Lake Travis. It is approximately 125 miles long. In the upper reaches, it is intermittent. Occasional, intense thunderstorms over the watershed create heavy rainfall that dramatically increases flow in the river. These surges of water typically transport large amounts of silt and organic debris downstream and into Lake Travis.

M - Meets water quality standard

| Station ID | Aquatic Life | | Recreation | General | | | | |
|------------|------------------|---------|------------|-------------|----|-------|-----------|-------------|
| | Dissolved Oxygen | Biology | Bacteria | Temperature | pH | Salts | Nutrients | Chlorophyll |
| 12319 | M | - | M | M | M | M | M | M |

Table 47. Summary of the 2014 Integrated Report / Segment 1405

| Station ID | Aquatic Life | | Recreation | General | | | | |
|------------|------------------|---------|------------|-------------|----|-------|-----------|-------------|
| | Dissolved Oxygen | Biology | Bacteria | Temperature | pH | Salts | Nutrients | Chlorophyll |
| 12369 | M | - | M | M | M | M | M | M |
| 12372 | M | - | M | M | M | M | M | M |
| 12375 | M | - | M | M | M | M | M | M |
| 12377 | M | - | M | M | M | M | M | M |
| 17472 | M | - | M | M | M | M | M | M |
| 21398 | M | - | M | M | M | M | M | M |

Table 48. Summary of the 2014 Integrated Report / Pedernales River

Figure 5-26. Example Watershed Summary #2 Page 6

Segment 1414 – Pedernales River (cont.)

Monitoring data collected from stations near Harper, Fredericksburg and Johnson City show the river meets all applicable water quality standards.

Trend analysis indicated a decrease in chloride (Figure 70), sulfate and TDS on the Pedernales River near Hammett's Crossing.

Monitoring data showed increasing bacteria levels at stations 17472 and 12375 (Figures 71 and 72). The cause of the trend is unknown, but the trend line indicates both stations are approaching the state criteria of 126 MPN. The trend may be drought-related.

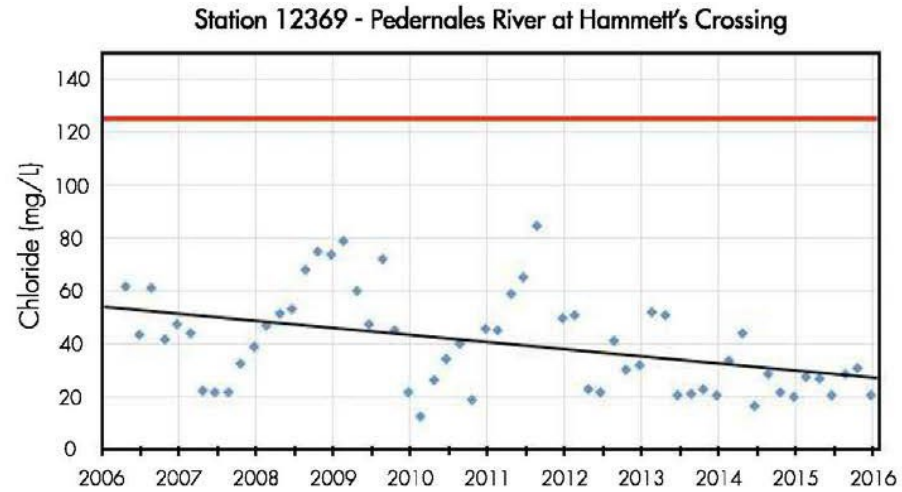
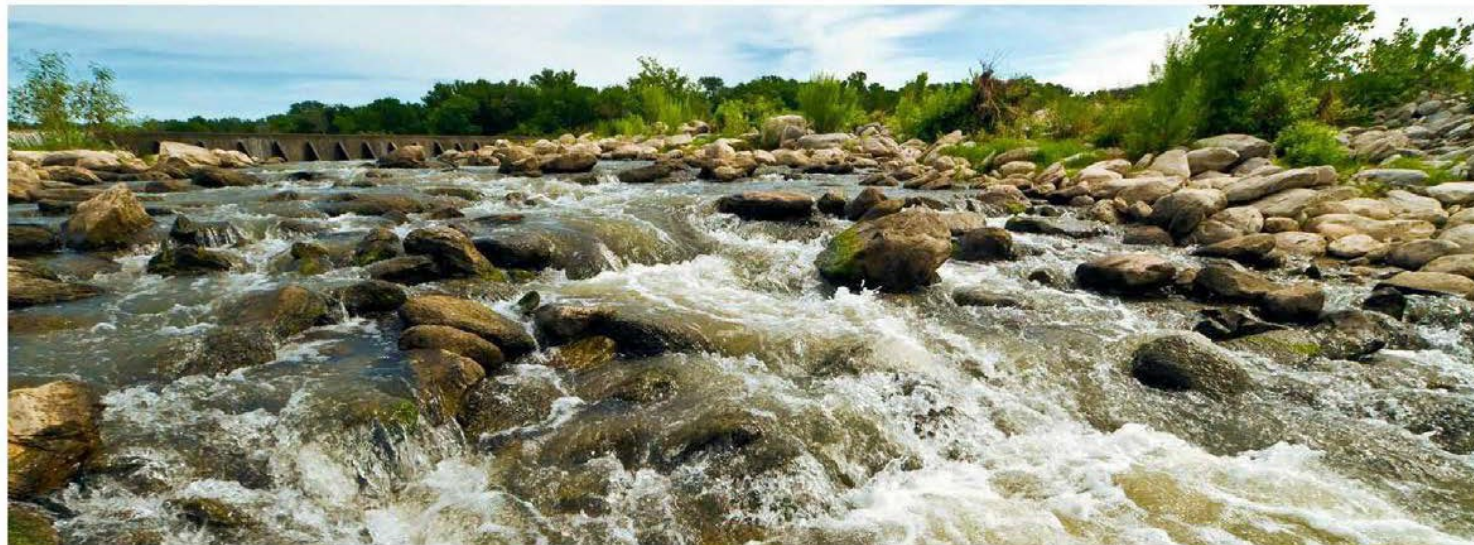
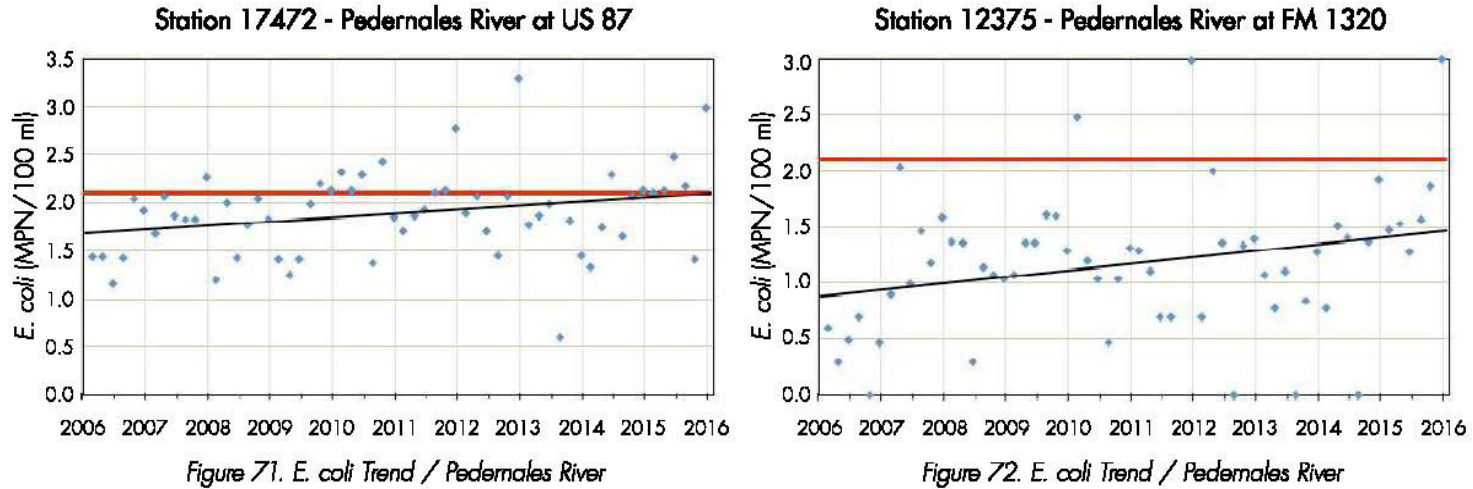


Figure 70. Chloride Trend / Pedernales River



Pedernales River in Blanco County

Figure 5-27. Example Watershed Summary #2 Page 7



Segment 1414B – Cypress Creek

Cypress Creek is a tributary of the Pedernales River near the confluence with Lake Travis. The stream is about 23 miles long, and historically has flowed year-round due to springs in the area. Intermittent flows have been recorded since the start of the drought in 2008. Water quality samples collected by the TCEQ from Station 12258 show the river meets all applicable water quality standards.

Bacteria levels have increased over time in Cypress Creek. Wildlife or livestock may be sources, but the reduced flow during the drought is a likely cause of the increasing trend. While the bacteria levels have not triggered an impairment, they are close to the state criteria, and they will exceed water quality standards if the trend continues over the next few years. TDS in Cypress Creek also increased. Despite the increase, TDS remains well below the criteria.

| Station ID | Aquatic Life | | Recreation | General | | | | |
|------------|------------------|---------|------------|-------------|----|-------|-----------|-------------|
| | Dissolved Oxygen | Biology | Bacteria | Temperature | pH | Salts | Nutrients | Chlorophyll |
| 12258 | M | - | M | M | M | M | M | M |

M - Meets water quality standard

Table 47. Summary of the 2014 Integrated Report / Cypress Creek

Exhibit 5G. Priority Parameter Descriptions (Example for the Basin Summary Report Water Quality Terminology)

Table 5-5. Priority Parameter Definitions and Descriptions

| Parameter | Impact | Potential Causes |
|------------------------------|--|---|
| Temperature | Water temperature affects the oxygen content of the water, with warmer water unable to hold as much oxygen. When water temperature is too cold, cold-blooded organisms may either die or become weaker and more susceptible to other stresses, such as disease or parasites. | Colder water can be caused by reservoir releases. Warmer water can be caused by removing trees from the riparian zone, soil erosion, or use of water to cool manufacturing equipment. |
| Conductivity | Conductivity is a measure of the water body's ability to conduct electricity and indicates the approximate levels of dissolved salts, such as chloride, sulfate, and sodium in the stream. Elevated concentrations of dissolved salts can impact the water as a drinking water source and as suitable aquatic habitat. | Runoff from agricultural and mining operations, industrial and wastewater discharge, and the surrounding geology of the area can affect conductivity. |
| pH | Most aquatic life is adapted to live within a narrow pH range. Different organisms can live at and adjust to differing pH ranges, but pH levels below four (the acidity of orange juice) or above 12 (the pH of ammonia) are lethal to most fish species. | Industrial and wastewater discharge, runoff from quarry operations and accidental spills. |
| Dissolved Oxygen (DO) | Organisms that live in the water need oxygen to live. In stream segments where DO is low, organisms may not have sufficient oxygen to survive. | Modifications to the riparian zone, human activity that causes water temperatures to increase, increases in organic matter, bacteria and over abundant algae may cause DO levels to decrease. |

| | | |
|--|--|---|
| <p>Stream Flow</p> | <p>Flow is an important parameter affecting water quality. Low flow conditions common in the warm summer months create critical conditions for aquatic organisms. At low flows, the stream has a lower assimilative capacity for waste inputs from point and nonpoint sources.</p> | <p>Stream flow may change as a result of natural factors (e.g., weather, groundwater discharge and recharge) or human factors (e.g., water withdrawals or discharges, land use changes).</p> |
| <p>Secchi Disc Transparency</p> | <p>Transparency is a measure of the depth to which light is transmitted through the water column and thus the depth at which aquatic plants can grow.</p> | <p>Low secchi disc depth is an estimate of turbidity. Low transparency can be caused by suspended sediment, organic matter, and algae.</p> |
| <p>Turbidity</p> | <p>Turbidity is a measure of the water clarity or light transmitting properties. Turbidity can impact primary productivity, habitat quality, and drinking water use.</p> | <p>Increases in turbidity are caused by suspended and colloidal matter such as clay, silt, finely divided organic and inorganic matter, plankton, and other microscopic organisms.</p> |
| <p>Hardness</p> | <p>The hardness of water is critical due to its effect on the toxicity of certain metals. Higher hardness concentrations in the receiving stream can result in reduced toxicity of heavy metals.</p> | <p>Hardness is a composite measure of certain ions in the water, primarily calcium and magnesium.</p> |
| <p>Chloride</p> | <p>Chloride is an essential element for maintaining normal physiological functions in all organisms. Elevated chloride concentrations can disrupt osmotic pressure, water balance and acid/base balances in aquatic organisms which can adversely affect survival, growth or reproduction.</p> | <p>Natural weathering and leaching of sedimentary rocks, soils and salt deposits can release chloride into the environment. Other sources can be attributed to oil exploration and storage, sewage, and industrial discharges, run off from dumps and landfills, and saltwater intrusion.</p> |

| | | |
|--|--|--|
| <p>Sulfate</p> | <p>Effects of high sulfate levels in the environment have not been fully documented. However, sulfate contamination may contribute to the decline of native plants by altering chemical conditions in the sediment.</p> | <p>Due to abundance of elemental and organic sulfur and sulfide mineral, soluble sulfate occurs in almost all natural waters. Other sources are the burning of sulfur containing fossil fuels, steel mills, and fertilizers.</p> |
| <p>Total Dissolved Solids (TDS)</p> | <p>High TDS may affect the aesthetic quality of the water, interfere with washing clothes, and corrode plumbing fixtures. High TDS in the environment can also affect the permeability of ions in aquatic organisms.</p> | <p>Mineral springs, carbonate deposits, salt deposits and sea water intrusion are sources for natural occurring high concentration TDS levels. Other sources can be attributed to oil exploration, drinking water treatment chemicals, storm water and agricultural runoff and point and nonpoint sources.</p> |
| <p>Bacteria <i>Escherichia coli</i> (<i>E. coli</i>) or Enterococci</p> | <p>Although fecal indicator bacteria may not themselves be harmful to human beings, their presence is an indicator of recent fecal matter contamination and that other pathogens dangerous to human beings may be present.</p> | <p>Present naturally in the digestive system of all warm-blooded animals, these indicator bacteria are in all surface waters. Poorly maintained or ineffective septic systems, overflow of domestic sewage or nonpoint sources and runoff from animal feedlots can elevate bacteria levels.</p> |
| <p>Ammonia Nitrogen</p> | <p>Elevated levels of ammonia in the environment can adversely affect fish and invertebrate reproductive capacity and reduce the growth of young.</p> | <p>Ammonia is excreted by animals and is produced during the decomposition of plants and animals. Ammonia is an ingredient in many fertilizers and is also present in sewage, storm water run-off, certain industrial wastewaters, and runoff from animal feedlots.</p> |

| | | |
|---|--|--|
| <p>Total Suspended Solids (TSS)</p> | <p>Suspended solids increase turbidity which reduces light penetration and decreases the production of oxygen by plants. They can also clog fish gills.</p> <p>Eventually, the suspended solids settle to the bottom of the stream or lake, creating sediment. Excessive sediment can cover instream habitat and smother benthic organisms and eggs.</p> | <p>Excessive TSS is the result of accelerated erosion and is often associated with high flows where riverbanks are cut, or sediment is suspended. It can also be the result of sheet erosion, where over land flow of water causes a thin layer of soil to be carried by the water to the stream.</p> <p>Disturbing vegetation without a proper barrier to slow down overland flow (such as construction sites or row cropping) increases TSS.</p> |
| <p>Nutrients Nitrogen Nitrate Total Phosphorus Ortho- phosphate phosphorus</p> | <p>Nutrients increase plant and algae growth. When plants and algae die, the bacteria that decompose them use oxygen. This reduces the dissolved oxygen in the water. High levels of nitrates and nitrites can produce nitrite toxicity, or “brown blood disease,” in fish. This disease reduces the ability of blood to transport oxygen throughout the body.</p> | <p>Nutrients are found in effluent released from wastewater treatment plants, fertilizers and agricultural runoff carrying animal waste from farms and ranches. Soil erosion and runoff from farms, lawns and gardens can add nutrients to the water.</p> |
| <p>Chlorophyll-a</p> | <p>High levels of chlorophyll-a can cause algae blooms, decrease water clarity, and cause swings in dissolved oxygen level due to photosynthesis. Most commonly measured as chlorophyll-a.</p> | <p>Algal blooms can result in elevated chlorophyll-a levels, indicating an increase in nutrients, such as nitrogen and phosphorus, which increase growth and reproduction in algal species.</p> |

Task 6: Stakeholder Participation and Public Outreach

In This Task

| | |
|---|-----|
| About Task 6 | 254 |
| Stakeholder Participation | 254 |
| Basin Steering Committee | 255 |
| Membership Guidelines | 255 |
| Regular Communication | 256 |
| Meetings | 257 |
| Scheduling..... | 257 |
| Meeting Announcements..... | 257 |
| Agenda Topics..... | 258 |
| Subcommittee Workgroups | 258 |
| Meeting Evaluation and Feedback | 259 |
| Stakeholder Process Evaluation | 259 |
| Cooperative Watershed Planning..... | 259 |
| Education and Outreach | 260 |
| EPA Outreach Documents | 261 |
| Planning Agency Website | 261 |
| Accessibility | 261 |
| Website Content..... | 263 |
| Deliverables to Post..... | 263 |
| Project Administration | 263 |
| Project Planning and Quality Assurance | 264 |
| Water Quality Monitoring..... | 264 |
| Data Management | 264 |
| Data Analysis and Reporting | 264 |
| Stakeholder Participation and Public Outreach | 264 |
| Special Projects | 264 |
| Updates | 264 |
| Volunteer Monitoring..... | 265 |
| Texas Stream Team..... | 265 |
| Exhibit 6A. Stakeholder Questionnaire | 266 |

About Task 6

This task involves multiple requirements from the Clean River Program legislation (TWC Section 26.0135) which are succinctly summarized by two objectives from the CRP Long Term Plan.

Objective 3: Promote cooperative watershed planning

Objective 4: Inform and engage stakeholders

To inform and engage stakeholders, the planning agencies need to build strong stakeholder groups and find innovative ways to maintain active participation. The Steering Committee serves as the main outreach tool of the CRP and is used to both disseminate information as well as obtain input on water quality concerns and monitoring requests. Additional means of informing and engaging stakeholders may include:

- Educational presentations
- Workshops
- Volunteer monitoring programs
- Public meetings
- Website updates
- News releases or public service announcements

To promote cooperative watershed planning, planning agencies may engage with federal, state, regional, and local planning agencies, governments, regulated entities, and the public to strategize ways to address water quality issues. The planning agencies may act as the basin's representative for state-level water quality initiatives such as Texas Surface Water Quality Standards revisions, Total Maximum Daily Loads, or even watershed protection plans.

Stakeholder Participation

A stakeholder is defined as any individual or entity that has a vested interest in the basin's waters; this includes the public, institutions, government, industry, fee payers, and other interested parties. It is important to get support from relevant stakeholders, those who help make decisions and those who will be affected by them, when planning and implementing watershed activities.

Stakeholder knowledge of local conditions provides additional information that can be valuable when used in conjunction with scientific efforts. This information helps to define water quality goals that are achievable. Planning agencies should ensure that the

contributions of stakeholders are recognized and used, in some manner, to achieve the goals of the CRP.

Basin Steering Committee

As one of the core elements of the CRP, the Steering Committee is an essential component of the public participation process that provides a forum for meaningful input by citizens and organizations that reside in or near the watershed. Planning agencies should strive to develop and maintain an active, diverse, and representative Steering Committee. Planning agencies have the responsibility to organize and lead at least one basin-wide Steering Committee per fiscal year that serves as the focus of public input and assists with:

- Creation of specific, achievable water quality objectives and basin priorities.
- Review and development of work plans and allocation of resources.
- Review, development, and approval of major reports.
- Establishment of monitoring priorities and development of monitoring plans.
- Identification of priority problem areas and possible actions to address these problems and pollutant sources.

Membership Guidelines

To ensure that the different interests, concerns, and priorities of each watershed are addressed, TAC rules (30 TAC Section 220.4) specify that the Steering Committee will include stakeholders from across the basin, representing:

- Citizens
- Fee-payers [identified in TWC Section 26.0135(h) and described under 30 TAC Chapter 21 relating to Water Quality Fees]
- Political subdivisions (including local, regional, and state officials)
- Appropriate state agencies, such as the:
 - Texas Commission on Environmental Quality
 - Texas Parks and Wildlife Department
 - Texas Water Development Board
 - Texas State Soil and Water Conservation Board
 - Texas General Land Office
 - Texas Department of State Health Services
 - Texas Department of Agriculture
 - Texas Railroad Commission
 - Texas Department of Transportation

Other persons or entities interested in water quality matters in the watershed or basin include:

- Environmental and public interest groups
- Agriculture
- Business and industry

Steering Committees should consist of stakeholders who are committed to identifying water quality issues in the basin, prioritizing resources and monitoring plans, and providing input on reports. Special emphasis should be placed on engaging and recruiting citizens to participate in Steering Committees because the general public is often the least represented stakeholder group.

To increase participation, planning agencies should take every opportunity to promote the CRP and the role of the Steering Committee. This includes using applicable CRP meetings, letters, the CRP promotional video, e-mails, websites, radio ads, questionnaires, etc. to introduce potential members to the CRP and promote participation in the Steering Committee. The Steering Committee composition must regularly be reviewed against the CRP membership guidelines to determine if reasonable representation is being maintained. A Steering Committee is considered reasonably representative when the composition of the committee closely reflects that of the surrounding area or of the basin. Planning agencies should consider stakeholder needs when planning the location, number, and frequency of stakeholder meetings. If groups listed in the membership guidelines are not represented, efforts should be made to recruit representatives before the next Steering Committee meeting. A list of all Steering Committee members and their affiliations will be maintained by the planning agency and submitted to the CRP project manager upon request.

Regular Communication

In addition to Steering Committee meeting discussions, it is recommended that additional forms of regular communication be established with Steering Committee members and other interested stakeholders to keep them informed of basin activities. The communication could be via e-mail or list server posting, phone calls, newsletters, or mailed letters. By encouraging frequent feedback from recipients, this process will contribute to project planning and Steering Committee meeting agenda development. Regular communication can include or address priority items such as the following:

- Special studies updates, including CRP and other studies
- Water quality reports
- Updates on water quality assessment information or Texas Surface Water Quality Standards revisions
- Announcements

- Upcoming events
- Agendas for upcoming meetings

Meetings

Steering Committees will meet publicly and should play an active role in the development of meeting agendas. To ensure program priorities are met and stakeholder issues are addressed, planning agencies need to incorporate the following guidance into meeting development.

Scheduling

Each fiscal year, planning agencies are required to conduct at least one Steering Committee meeting to address basin-wide water quality issues. Due to the size and diversity of individual basins, it may be difficult for a single annual meeting to fully accomplish all meeting requirements. In that case, planning agencies should consider multiple Steering Committee meetings. The planning agency can choose to hold the meeting(s) at any time of the year. It is preferable to hold the meeting(s) in February or March to ensure input in advance of the Coordinated Monitoring Meetings. While this is a priority for the meeting, that objective can be accomplished through emails to Steering Committee members requesting their input on the monitoring schedule. In addition, input on annual reports can also be requested via email to allow the stakeholders more flexibility in providing comments on the report.

Meetings should be scheduled on convenient dates and times that facilitate maximum stakeholder attendance and participation; these dates and times should account for stakeholders traveling from other parts of the basin. **It is important that planning agencies negotiate mutually agreeable Steering Committee meeting dates with their TCEQ CRP project manager before stakeholders are notified of the meeting date.**

Meeting Announcements

To provide adequate notice of upcoming Steering Committee meetings, it is necessary that planning agencies issue a **“save the date” notification a minimum of 45 days in advance** of the next meeting.

Planning agencies should contact all Steering Committee members with a questionnaire or survey to confirm their continued participation, provide a list of the draft meeting agenda topics, and request additional topics and potential stakeholders. See Exhibit 6A for a sample questionnaire. A final meeting announcement with the proposed agenda should be distributed **a minimum of 15 days in advance of the meeting** by use of written or electronic invitations. In addition, the planning agency will post the meeting agenda and date on their website and, when feasible, send meeting information to local news outlets.

Agenda Topics

The Steering Committee has a vital role in developing and reviewing priority items. The items that require Steering Committee input include:

- Water Quality Objectives and Priorities—Development of monitoring priorities.
- Basin Summary and Highlights Reports—Review, suggestions for modification, and approval of the draft Basin Summary and Highlights Reports prior to publication.
- Work plans and Allocation of Resources—Operation and effectiveness of the CRP work plan and the use, adequacy, and allocation of the program’s costs and funds.
- Public Participation—Upcoming events, public outreach, and educational activities.

Additional items that should be addressed during Steering Committee meetings on an annual basis include the following:

- Overview of the CRP, including its goals and how the program is funded.
- Recent planning agency accomplishments achieved with CRP support.
- Identification, selection, and status of special study projects.
- Recognition of the efforts of Steering Committee, stakeholders, volunteers, and others.

Along with the above topics, Steering Committee meetings will also provide the opportunity to discuss any topics that are of significant interest to stakeholders, including nonpoint source pollution issues, groundwater quality or availability, illegal dumping, basin-specific problems, agricultural issues, and clean-up efforts. To provide additional viewpoints and expertise, planning agencies should seek out subject matter experts to present on applicable topics.

To meet these requirements, it is important that planning agencies provide Steering Committee members with all necessary meeting materials, including the agenda, draft reports, summaries, work plans, special studies, maps, monitoring schedules and other items to be discussed.

Subcommittee Workgroups

The Steering Committee may create smaller sub-committee workgroups to address certain, high-priority activities more efficiently. These workgroups have the responsibility of addressing, in greater detail, special studies, project planning, development of monitoring priorities, and implementation activities. In establishing a sub-committee workgroup, the Steering Committee should attempt to bring together the most appropriate skills and resources available to advance projects.

Meeting Evaluation and Feedback

It may be useful to distribute an evaluation at the end of the meeting to determine if stakeholder needs and concerns have been met. After each meeting, planning agencies have the responsibility to ensure that stakeholder input, comments and decisions are appropriately addressed, that sub-committee meetings are scheduled if necessary, and that meeting minutes are posted to the website.

Stakeholder Process Evaluation

Planning agencies should evaluate their stakeholder process for effectiveness and engagement. Questions that may facilitate that evaluation include, but are limited to, the following:

- Is the steering committee membership representative of the basin?
- How has the steering committee membership composition changed over time?
- Is the planning agency recruitment process targeting representatives from the following groups: persons paying fees under [TWC Section 26.0291](#),⁴⁴ private citizens, the Texas State Soil and Water Conservation Board, representatives from other appropriate state agencies, political subdivisions, and other persons with an interest in water quality matters of the watershed or river basin?
- Do stakeholders respond to regular communication, if appropriate?
- How can stakeholders be more regularly involved and how can engagement be increased?
- What percentage of steering committee members attend the Steering Committee Meetings?

Cooperative Watershed Planning

Watershed action planning (WAP) is the state's coordinated approach to develop, coordinate, and track actions taken to address water quality issues. WAP is a flexible approach that utilizes a range of strategy options to address impaired water bodies on the 303(d) List and other water quality issues. Information related to these strategies is stored in a database called the WAP tool. The WAP tool can be queried to identify current and planned activities to address water quality issues in the state. This process provides the framework that each program area, partner agency, and stakeholder can use for planning, budgeting, and implementing activities as they relate to addressing water quality issues.

⁴⁴ www.statutes.legis.state.tx.us/GetStatute.aspx?Code=WA&Value=26.0291

Due to the longstanding relationship between TCEQ and the planning agencies, the planning agencies are considered the first among many potential stakeholders in WAP. Planning agencies participation in the WAP process is critical because of their role in establishing and maintaining partnerships with state agencies, regional entities, local governments, industry, and citizens. These partnerships between TCEQ, the planning agencies, and their local stakeholders will help determine the appropriate watershed planning strategy to address water quality issues.

Local watershed meetings and solicitations, including but not limited to the Steering Committee Meetings and Coordinated Monitoring Meetings, are integral to gather information to better understand and define the circumstances leading to water quality impairments and concerns. Certain efforts will need to be made to get input from select stakeholders that are the most closely associated with the waters of interest.

The type of data and information to be gathered through the local watershed discussions may include:

- Watershed Evaluation—Gather watershed maps, land use classifications, and models. Identify data gaps and data acquisition projects.
- Pollution Sources—Identify potential point and nonpoint sources of pollution, evaluate pollution sources, identify pollution control practices, identify data gaps and data acquisition projects.
- Water Quality Monitoring—Identify water quality monitoring sites, identify water quality indicators, identify data gaps and data acquisition projects.
- Watershed Stakeholders—Identify key stakeholders, characterize stakeholder support, identify issues of concern and watershed goals.
- Public—Characterize public support, identify issues of concern and watershed goals.
- Watershed Planning Strategy—Identify what option(s) (e.g., use-attainability analysis, total maximum load, watershed protection plan, etc.) the public and local stakeholders recommend be considered to address each water quality issue.

Education and Outreach

Planning agencies should work to increase public awareness and interest and enhance public participation in setting and implementing basin priorities. Opportunities for participation in the CRP that support overall program goals include the following:

- Presentations or booths at schools, public meetings, and conferences.
- Distribution of applicable educational materials, curriculum, and the CRP video.

- Development or distribution of fact sheets or newsletters.
- News releases, public service announcements, and advertisements.
- E-mail groups, up-to-date CRP website, and email list servers.
- Participation in volunteer monitoring programs.
- Participation in the Texas Watershed Stewards program.

With prior approval, funds may also be applied to outreach activities such as community action projects, including clean-up events, collection or disposal of hazardous household or agricultural products, watershed surveys, and storm drain stenciling.

Outreach efforts and purchases must directly support the CRP contract through association with a task or deliverable. If there isn't a direct relation to the CRP contract, including a deliverable, then CRP funds cannot be utilized, even if the public outreach efforts are to support a worthy cause.

EPA Outreach Documents

To assist in meeting the legislative obligations of the CRP and other water quality objectives, planning agencies should inform stakeholders about water quality issues, the possible or required actions needed to address these issues and should motivate the stakeholders to act. To help planning agencies accomplish this, two EPA publications are recommended as resources: *Getting in Step: A Guide for Conducting Watershed Outreach Campaigns 3rd Edition*, and *Getting in Step: Engaging and Involving Stakeholders in Your Watershed 2nd Edition*. The guides provide the tools needed to develop and implement an effective outreach campaign as part of a regional water quality improvement effort; the publications also offer guidance for understanding the audiences in your watershed, creating resonating messages, and finding appropriate ways to communicate.

Planning Agency Website

Planning agency CRP websites have been established to effectively circulate information and to enhance public access to detailed information regarding CRP activities. This form of communication is an important tool for increasing stakeholder and public awareness and improving involvement in the CRP.

Accessibility

Online or web accessibility means that people with disabilities can use the Internet. Accessibility is ensuring that people with disabilities can use, perceive, understand, navigate, and interact with the Internet and the content it contains. The provision in the CRP contracts relating to accessibility is as follows:



Any electronic content and documents created as deliverables under Clean Rivers Program contracts must meet the accessibility standards prescribed in Title 1 Texas Administrative Code, Section 206.50 and Chapter 213 for state agency webpages, web content, software, and hardware, unless TCEQ agrees that exceptions or exemptions apply.

General guidelines for developing accessible text documents, reports or deliverables include the following:

- Fonts are of appropriate style, size, color, and contrast.
- Titles and headers are of sufficient size difference to body text.
- Text is left-aligned and not justified.
- Images and figures have alternative text.
- Content is structured in a meaningful sequence or a logical way.

Website Content

During the upcoming biennium, planning agencies will continue to update and improve their CRP websites. To meet CRP goals, planning agency websites need to include the following items and information:

- **Explanation of CRP, the planning agency, program goals, and the planning process**, to include basin specific priorities developed from stakeholder input, a description and promotion of the Steering Committee process, defined roles for stakeholders, Steering Committee meeting minutes, and information on how to get involved.
- **Upcoming events and project updates**, including Steering Committee meeting announcements and agendas, updates on special studies or a summary of project activities, and notification of other applicable and upcoming public outreach events occurring in the basin.
- **Contact information for planning agency**, to include: e-mail addresses, telephone numbers, mailing address, and physical address.
- **Links to outside resources**, including the TCEQ Clean Rivers Program, other CRP planning agencies, and the Texas Stream Team Volunteer Monitoring Program.
- **Link to the CMS website**, with disclaimer that states that the CMS includes stations monitored by other entities.

Deliverables to Post

The following is a summary of the required work plan deliverables for all tasks in the FY2024-25 CRP Guidance that must be posted on the planning agency website.

Project Administration

- Final Work Plan

Project Planning and Quality Assurance

- Complete Quality Assurance Project Plan OR:
- Monitoring and Project Objectives (A6, B1), Measurement Performance Specifications (Table A7.1), and Special Study Appendices

Water Quality Monitoring

- Special Study Reports
- Link to CRP [Coordinated Monitoring Schedule](#)⁴⁵

Data Management

- Water Quality Monitoring Data or Link to TCEQ Water Quality Data

Data Analysis and Reporting

- Basin Highlights Report (with archived reports for the last five years)
- Basin Summary Report (at a minimum: executive summary and maps)

Stakeholder Participation and Public Outreach

- Announcements and Agendas of Steering Committee and CRP Public Meetings
- Steering Committee Meeting Minutes or Summaries

Special Projects

- Special Studies or Project Reports

Updates

The website will be reviewed on a quarterly basis to ensure that information and announcements remain current and relevant. **It is required that the planning agency also include summaries of revisions to the website with the corresponding quarterly progress report.**

Deliverables required to be posted to the website will follow the due dates indicated in the individual work plans. Posting dates for certain reports and project plans that are based on completion of the document or meeting should be negotiated with the TCEQ CRP project manager.

45. cms.lcra.org/

Volunteer Monitoring

Monitoring of local water bodies by citizen volunteers is a good option for involving stakeholders in water quality activities. Planning agencies can use volunteer monitoring activities to do the following:

- Educate citizens about water quality and watershed management issues.
- Enhance public participation in setting and implementing basin priorities.
- Collect water quality data for planning purposes.

Planning agencies can choose to implement a volunteer monitoring program based on their own pre-determined set of guidelines or can choose to implement activities supported by the Texas Stream Team Volunteer Monitoring Program.

Texas Stream Team

The Texas Stream Team Volunteer Monitoring Program can serve as a resource for a variety of outreach and training materials. Through a partnership with TCEQ, EPA, and Texas State University, the Texas Stream Team supports environmental education activities and volunteer monitoring data collection programs throughout the state. The program also assists participating partners and develops, promotes, and maintains environmental education activities. Additional information can be obtained by contacting the Texas Stream Team directly, or by visiting the [Texas Stream Team Website](#).⁴⁶

Planning agencies that choose to implement volunteer monitoring should determine the appropriate methods and focus for these activities in their basins. As it relates to the CRP, the collection of volunteer water quality data is considered an educational activity to promote or enhance public awareness of water quality issues and involvement in CRP goals. To support this, the Texas Stream Team's QAPP limits the designated use for volunteer data to education and research, problem identification, and planning purposes.

46. www.meadowscenter.txstate.edu/Leadership/TexasStreamTeam.html



Exhibit 6A. Stakeholder Questionnaire

Instructions: Use the following template as a questionnaire to provide to your stakeholders to confirm their continued participation, provide a list of draft meeting agenda topics, and request additional topics and potential stakeholders.

Questionnaire

To better serve our stakeholders, we would like to know about topics and other water issues relevant to you, our stakeholders, that should be addressed in future Clean Rivers Program (CRP) meetings. The following are topics for discussion for our next stakeholder meeting, which will be held on [DATE]. Please rate them on a scale according to how important these issues are as they relate to inclusion in our next CRP meeting agenda.

You will be contacted with further information regarding our next meeting. We appreciate your past participation and look forward to your continued participation.

1. List topic (e.g., Watershed Protection Plans, etc.)

- Very important
- Somewhat important
- Unsure
- Not very important
- Not at all important

2. List topic (e.g., Watershed Protection Plans, etc.)

- Very important
- Somewhat important
- Unsure
- Not very important
- Not at all important

3. Are there any other water quality related issues in the basin that you would like highlighted or discussed? Please describe.



4. Are you interested in receiving correspondence from the river authority regarding CRP meetings and other stakeholder events?
 Yes
 No

5. Can you provide the names or organizations of potential stakeholders that may be interested in CRP activities?



To facilitate future communication, please provide the following contact information:

Name

Organization or Agency

Address

Phone #

E-mail address

Thank you for taking the time to complete this survey!

If you have questions or need additional information about his meeting, please contact: *[Insert river authority contact information here]*



Task 7: Special Projects

In This Task

| | |
|----------------------------------|-----|
| About Task 7 | 271 |
| Nonpoint Source Projects | 272 |
| Watershed Protection Plans | 272 |

About Task 7

Special projects may be developed to address water quality concerns identified by CRP partners and steering committees as priority issues for the basin. These special projects differ from special studies that involve water quality sampling activities outlined in Task 3.

Some types of special projects that may be considered under this task include:

- Support of watershed protection plans and other nonpoint source pollution prevention related activities.
- Source water protection and assessment.
- Defining groundwater geology in reference to its potential impact on surface water quality.
- Water conservation planning efforts to help increase flow during low-flow periods.
- Investigation and evaluation of existing data to help define sources or causes.

If more than one project is planned, each one should be defined as a subtask (task 7.1, task 7.2, etc.) with separate plans, deliverables, and budgets. Planning agencies should work closely with their TCEQ CRP project manager since most of these projects will require meetings to discuss and scope out project plans. At a minimum, project activities should be described for each quarter and provided with the quarterly progress report. If CRP funds are used to match activities under a federal grant, the amount of match and related activities need to be reflected in each progress report for Task 7.

Note: Certain special projects may not be considered allowable based on their outlined activities and ultimate function. As in the past, implementation projects are not allowable.

Planning agencies should involve local stakeholders in a collaborative effort to develop project plans and to secure additional resources. Existing forums, such as the CRP steering committees, TMDL watershed committees, source water assessment and protection committees, and basin water planning committees, can be used to initiate and advance the water quality projects. Relevant issues should be made available to the public for review and comment through the planning agency's website, e-mail, letter distributions, and news releases.

Below are three options for how a planning agency may get involved in a water quality project in their basin:

Option #1: (Least intensive) Planning agencies support the water quality project taking place in their area and are present at the planning meetings. They provide their insight, knowledge, and recommendations for a more successful project.

Option #2: Planning agencies go beyond the general support at planning meetings by providing one-time assistance in the field and some general guidance to aid in defining potential sources and causes.

Option #3: At this level of participation, planning agencies become the coordinating entity and follow the steps for the creation of a water quality project, while TCEQ is in a supporting role. Planning agencies organize the planning meetings, conduct source inventories, update and submit the information to TCEQ, and complete an evaluation report. The report includes a description of the assessment results, maps and descriptions of the identified potential sources and causes, a monitoring plan, and a list of the most appropriate BMPs to address concerns identified during the project. The funding of this level of participation may be through TCEQ or other external funding sources.

Nonpoint Source Projects

Section 319(h) of the Clean Water Act (CWA) authorizes the distribution of federal funds for implementation of nonpoint source (NPS) pollution prevention and restoration activities. The CWA 319(h) grant program supports three basic types of activities: assessment, implementation of BMPs, and development of watershed protection plans. CRP funds may be used to support activities related to assessment and the development of watershed protection plans, but not implementation. Eligible assessment activities involve the collection and analysis of information about NPS pollution, its effect on water quality in specific bodies of water, and the results of BMPs used to reduce NPS pollution. Special studies involving monitoring should be addressed in Task 3.

Watershed Protection Plans

Watershed protection plans are comprehensive plans designed to protect unimpaired waters and restore impaired waters. Grants for CWA 319(h) projects are subject to a 40 percent local match on the part of the implementing entity. CRP activities related to the project can be used to help fulfill this match requirement.