

**Texas Nonpoint Source Grant Program**

***Recreational Use Attainability Analysis  
for White Oak Creek (0303B) and South Lilly Creek (0409B)***

**TSSWCB Project # 16-60  
Revision 1**

**Quality Assurance Project Plan**

**Texas State Soil and Water Conservation Board**

**Prepared by  
Texas Institute for Applied Environmental Research  
Stephenville, Texas**

**Effective Period: Upon TSSWCB Approval through October 2017  
with annual updates required**

**Questions concerning this quality assurance project plan should be directed to:**

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**A1 Approval Sheet**

Quality Assurance Project Plan (QAPP) for *Recreational Use Attainability Analysis for One Water Body in the Sulphur River Basin and One Water Body in the Cypress Creek River Basin.*

**Texas State Soil and Water Conservation Board (TSSWCB)**

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Title: TSSWCB Project Manager (PM)

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name: Mitch Conine  
Title: TSSWCB Quality Assurance Officer (QAO)

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Texas Institute for Applied Environmental Research (TIAER)**

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Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name: Sarah Robinson  
Title: TIAER Field Operations Supervisor

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name: Anne McFarland  
Title: TIAER Project QAO

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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<b>A2</b>	<b>Table of Contents</b>	
<b>A1</b>	<b>Approval Sheet</b> .....	<b>3</b>
<b>A2</b>	<b>Table of Contents</b> .....	<b>5</b>
	<b>List of Acronyms</b> .....	<b>7</b>
<b>A3</b>	<b>Distribution List</b> .....	<b>9</b>
<b>A4</b>	<b>Project/Task Organization</b> .....	<b>10</b>
	<b>Figure A4.1 Organization Chart – Lines of Communication</b> .....	<b>12</b>
<b>A5</b>	<b>Problem Definition/Background</b> .....	<b>13</b>
<b>A6</b>	<b>Project/Task Description</b> .....	<b>15</b>
	<b>Table A6.1. Schedule of Milestones</b> .....	<b>16</b>
<b>A7</b>	<b>Quality Objectives and Criteria</b> .....	<b>18</b>
<b>A8</b>	<b>Special Training/Certification</b> .....	<b>20</b>
<b>A9</b>	<b>Documents and Records</b> .....	<b>21</b>
<b>B1</b>	<b>Sampling Process Design (Experimental Design)</b> .....	<b>23</b>
	<b>Table B1.1. White Oak Creek (303B) RUAA Sites</b> .....	<b>26</b>
	<b>Table B1.2. South Lilly (409B) RUAA Sites</b> .....	<b>31</b>
<b>B2</b>	<b>Sampling Methods</b> .....	<b>32</b>
<b>B3</b>	<b>Sample Handling and Custody</b> .....	<b>34</b>
<b>B4</b>	<b>Analytical Methods</b> .....	<b>35</b>
<b>B5</b>	<b>Quality Control</b> .....	<b>36</b>
<b>B6</b>	<b>Instrument/Equipment Testing, Inspection and Maintenance</b> .....	<b>37</b>
<b>B7</b>	<b>Instrument/Equipment Calibration and Frequency</b> .....	<b>38</b>
<b>B8</b>	<b>Inspection/Acceptance of Supplies and Consumables</b> .....	<b>39</b>
<b>B9</b>	<b>Non-direct Measurements</b> .....	<b>40</b>
	<b>Table B9.1 Non-Direct (Acquired) Data Required for Site Selection and Characterization of each Segment Watershed</b> .....	<b>41</b>
<b>B10</b>	<b>Data Management</b> .....	<b>43</b>
<b>C1</b>	<b>Assessments and Response Actions</b> .....	<b>44</b>
	<b>Table C1.1 Assessments and Response Actions</b> .....	<b>44</b>
<b>C2</b>	<b>Reports to Management</b> .....	<b>45</b>
<b>D1</b>	<b>Data Review, Verification, and Validation</b> .....	<b>46</b>
<b>D2</b>	<b>Verification and Validation Methods</b> .....	<b>47</b>
<b>D3</b>	<b>Reconciliation with User Requirements</b> .....	<b>48</b>
	<b>Appendix A: Area Location and RUAA Station Maps by Watershed</b> .....	<b>49</b>
	<b>Appendix B: RUAA Field Data Sheets</b> .....	<b>56</b>

**Appendix C: Contact Information and RUAA Interview Forms..... 65**  
**Appendix D: Corrective Action Report Form..... 69**

## List of Acronyms

CAFO	Confined Animal Feeding Operation
CAR	Corrective Action Report
CBMS	Computer Based Mapping System
DEM	Digital Elevation Model
DMR	Discharge Monitoring Report
DOQQ	Digital Ortho Quarter Quads
ECHO	Enforcement & Compliance History Online
EPA	United States Environmental Protection Agency
FM	Farm-to-Market
GIS	Geographic Information System
GPS	Global Positioning System
HWY	Highway
ICIS	Integrated Compliance Information System
NAIP	National Agricultural Imagery Program
NASS	National Agricultural Statistics Service
NHD	National Hydrography Dataset
NLCD	National Land Cover Dataset
NPDES	National Pollution Discharge Elimination System
PM	Project Manager
QA	Quality Assurance
QAM	Quality Assurance Manual
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QC	Quality Control
QPR	Quarterly Progress Report
RUAA	Recreational Use Attainability Analysis
SH	State Highway
SOP	Standard Operating Procedure
SSURGO	Soil Survey Geographic database
SWQMIS	Surface Water Quality Monitoring Information System
TCEQ	Texas Commission on Environmental Quality
TIAER	Texas Institute for Applied Environmental Research

TMDL	Total Maximum Daily Load
TPDES	Texas Pollution Discharge Elimination System
TNRIS	Texas Natural Resources Information System
TSSWCB	Texas State Soil and Water Conservation Board
TSWQS	Texas Surface Water Quality Standards
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WWTF	Wastewater Treatment Facility

### **A3 Distribution List**

Organizations, and individuals within, which will receive copies of the approved QAPP and any subsequent revisions include:

#### **Texas State Soil and Water Conservation Board (TSSWCB)**

PO Box 658  
Temple, TX 76503

Name: Wesley Gibson  
Title: TSSWCB PM

Name: Mitch Conine  
Title: TSSWCB QAO

#### **Texas Institute for Applied Environmental Research (TIAER)**

Tarleton State University, Box T-0410  
Stephenville, TX 76402

Name: Leah Taylor  
Title: TIAER PM

Name: Sarah Robinson  
Title: TIAER Field Operations Supervisor

Name: Anne McFarland  
Title: TIAER Project QAO

## **A4 Project/Task Organization**

The following is a list of individuals and organizations participating in the project with their specific roles and responsibilities:

### **TSSWCB**

#### **Wesley Gibson**

##### **TSSWCB PM**

Maintains a thorough knowledge of work activities, commitments, deliverables, and time frames associated with project. Develops lines of communication and working relationships between TIAER and TSSWCB. Tracks deliverables to ensure that tasks are completed as specified in the contract. Responsible for ensuring that the project deliverables are submitted on time and are of acceptable quality and quantity to achieve project objectives. Participates in the development, approval, implementation, and maintenance of the QAPP. Assists the TSSWCB QAO in technical review of the QAPP. Responsible for verifying that the QAPP is followed by project participants. Notifies the TSSWCB QAO of particular circumstances that may adversely affect the quality of data derived from the collection and analysis of samples. Enforces corrective action.

#### **Mitch Conine**

##### **TSSWCB QAO**

Reviews and approves QAPP and any amendments or revisions and ensures distribution of approved/revised QAPPs to TSSWCB and project participants. Responsible for verifying that the QAPP is followed by project participants. Determines that the project meets the requirements for planning, quality assurance (QA), quality control (QC), and reporting under the TSSWCB Texas Nonpoint Source Grant Program. Coordinates or conducts audits of field and laboratory systems and procedures. Monitors implementation of corrective actions.

### **TIAER**

#### **Leah Taylor**

##### **TIAER PM & Data Manager**

Responsible for ensuring tasks and other requirements assigned to TIAER in the contract are executed on time and are of acceptable quality. Coordinates attendance at conference calls, training, meetings, and related project activities with the TSSWCB. Monitors and assesses the quality of work. Responsible for writing and maintaining the QAPP, verifying it is followed and the project produces data of known and acceptable quality. Provide the point of contact for resolving issues related to the data. Develop and maintain relationships with landowners and stakeholders. Ensure tasks and other requirements in the contract are executed on time and are of acceptable quality. Complies with corrective action requirements. Reports status, issues, and progress of the overall project to TSSWCB PM.

**Sarah Robinson**

**TIAER Field Operations Supervisor**

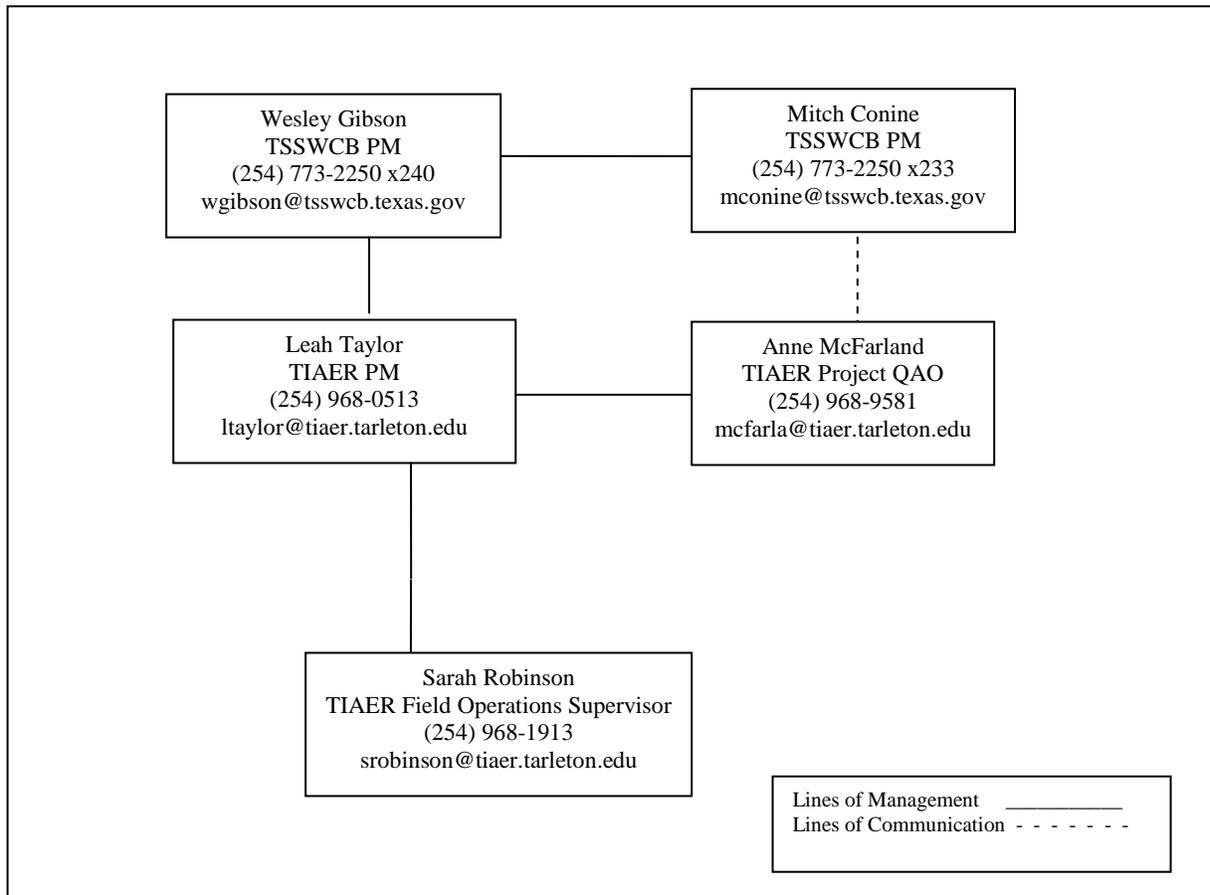
Responsible for supervising all aspects of the measurements and data collection for surface water and other RUAA information in the field. Responsible for the acquisition of field data measurements in a timely manner that meet the quality objectives specified in Section A7 (Table A.1), as well as the requirements of Sections B1 through B8. Responsible for field scheduling, staffing, and ensuring that staff is appropriately trained as specified in A8. Responsible for verifying the QAPP is followed and the project produces data of known and acceptable quality. Comply with corrective action requirements.

**Anne McFarland**

**TIAER Project QAO**

Responsible for coordinating development and implementation of the project QA program. Responsible for maintaining records of project QAPP distribution, including appendices and amendments. Responsible for maintaining written records of sub-tier commitment to requirements specified in this QAPP. Responsible for identifying, receiving, and maintaining project QA records. Responsible for coordinating with the TSSWCB QAO to resolve QA-related issues. Notifies TIAER PM of particular circumstances that may adversely affect the quality of data. Coordinates the review of technical QA material and data related to water quality monitoring system design and analytical techniques. Supervises monitoring systems audit for the project.

**Figure A4.1 Organization Chart – Lines of Communication**



## **A5 Problem Definition/Background**

This QAPP addresses two creeks located in the eastern region of Texas listed for bacterial impairments on the 2014 Texas 303(d) List (see Appendix A for area location map). White Oak Creek (0303B) is located in the Sulphur River Basin. South Lilly Creek (0409B) is located in the Northeast Texas Municipal Water District (NETMWD) and Cypress Creek Basin.

White Oak Creek (0303B) is located in the north eastern region of Texas. Water body 0303B encompasses portions of Hopkins, Franklin, Titus, Red River, and Morris Counties and flows under U.S. Hwy 271 and Interstate 30 E in Titus County. South Lilly Creek, located in the NETMWD, is also located in the north eastern region of Texas within Wood, Camp and Upshur Counties.

The *2014 Texas 303(d) List* included bacterial impairments for water bodies within the Sulphur River Basin is assessment units 0303B\_01 and 0303B\_4 for White Oak Creek.

The *2014 Texas 303(d) List* included bacterial impairments for water bodies within the Cypress Creek Basin are assessment units 0409B\_01 for South Lilly Creek.

The Texas Commission on Environmental Quality (TCEQ) and the TSSWCB established a joint, technical Task Force on Bacteria Total Maximum Daily Loads (TMDLs) in September 2006 charged with making recommendations on cost-effective and time-efficient bacteria TMDL development methodologies. The Task Force recommended the use of a three-tier approach that is designed to be scientifically credible and accountable to watershed stakeholders. In June 2007, the TCEQ and the TSSWCB adopted the principles and general process recommended by the Task Force. Fundamental in the three-tier approach is ensuring that the appropriate water quality standard (i.e., designated use) is applied to the water body before initiating any watershed planning activity (e.g., TMDL or watershed protection plan).

Major revisions to the Texas Surface Water Quality Standards (TSWQS) were adopted by TCEQ in 2010 and approved by the United States Environmental Protection Agency (EPA) in 2011, including modifications to contact recreation use and bacteria criteria. As part of this process, TCEQ developed formal procedures for conducting Recreational Use Attainability Analysis (RUAAs). In order for a new category of recreational use, and, thus, a different water quality criterion for bacteria to be applied to a water body, a RUAA will need to be conducted. TCEQ and TSSWCB have collaborated on developing a list of priority water bodies for collecting information needed for RUAAs and the water bodies for this project (White Oak Creek and South Lilly Creek) are on that list. Because primary contact recreation use is presumed for the water bodies in the study area and it is not known with certainty that recreational use in these water bodies occurs. The findings from an RUAA will provide information regarding the level of recreational use actually occurring in these water bodies.

In accordance with the Watershed Action Planning process (<http://www.tceq.texas.gov/waterquality/planning/wap/>) and the *Memorandum of Agreement Between the TCEQ and the TSSWCB Regarding TMDLs, Implementation Plans, and Watershed*

*Protection Plans*, the TSSWCB has agreed to take the lead role in addressing the bacteria impairments in this project's study area. Through this project, the TSSWCB and TIAER will work with local stakeholders to complete the data collection components of an RUAA and at the end of this project have adequate data that either supports the existing designated use (primary contact recreation) or supports a change in designated use (e.g., secondary contact recreation) for the nine unclassified water bodies and one classified segment in this project.

## **A6 Project/Task Description**

The overall goal of the project is to collect data that provide stakeholders and agencies with sufficient information to determine recreational use status throughout the two watersheds (White Oak Creek and South Lilly Creek). This project consists of performing Comprehensive RUAs on one unclassified water body (0303B) within the Sulphur River Basin and one unclassified water body (0409B) within the NETMWD for the purpose of ascertaining the level of recreational use within each water body. This project will follow the March 2014 *TCEQ Procedures for a Comprehensive RUA and a Basic RUA Survey*.

These comprehensive RUAs consist of four main tasks: a) public participation and stakeholder interaction through educational outreach meetings, interviews and historical review of the recreational use of each water body; b) compilation of existing Geographic Information System (GIS) data pertaining to each watershed including spatial identification of potential sources, such as point source dischargers; c) completion of the required two RUA field surveys of each creek; and d) review of water quality and other data to characterize each watershed. This QAPP focuses specifically on the direct data collection associated with the RUA field surveys.

Project-related tasks and the schedule of deliverables are defined in Table A6.1.

**Table A6.1. Schedule of Milestones**

<b>Task</b>	<b>Project Milestones</b>	<b>Start<sup>1</sup></b>	<b>End<sup>2</sup></b>
<b>2</b>	<b>Quality Assurance</b>		
2.1	QAPP development and approval by the TSSWCB	Month 1	Month 8
2.2	Annual QAPP updates and amendments, as needed	Month 9	Month 24
<b>3</b>	<b>Assess Attainability of Recreational Use</b>		
3.1	Conduct RUAA site reconnaissance and coordinate with landowners for access where appropriate	Month 1	Month 6
3.2	Identify sites for RUAA data collection	Month 5	Month 8
3.3	Conduct historical information review on recreation uses	Month 1	Month 18
3.4	Conduct RUAA field surveys	Month 9	Month 12
3.5	Collect digital photographic record	Month 9	Month 12
3.6	Conduct interviews	Month 9	Month 18
3.7	Develop technical RUAA report	Month 13	Month 24
<b>4</b>	<b>Public Participation and Stakeholder Coordination</b>		
4.1	Facilitate public participation and coordinate stakeholder involvement	Month 1	Month 24
4.2	Contact entities on Contact Information Form	Month 1	Month 3
4.3	Conduct at a minimum two informational meetings, one prior to the first RUAA field survey and the second to present findings. An interim meeting of preliminary findings may be conducted after the first field survey.	Month 2	Month 24
4.4	Participate in other public meetings, as appropriate	Month 1	Month 24
4.5	Develop and disseminate educational material	Month 1	Month 24
<b>5</b>	<b>GIS Inventory and Water Quality Review</b>		
5.1	Develop comprehensive GIS inventory	Month 1	Month 8
5.2	Conduct historical data review of each water body to assess and characterize trends in water quality, specifically bacteria	Month 1	Month 18

<sup>1</sup> Month 1 = November 2015

<sup>2</sup> Month 24 = October 2017

Using GIS inventory and other pertinent information, TIAER will identify sites, with the help of stakeholders, for RUAA field data collection. Sites will be located in areas where the water body is accessible to the public and have the highest potential for recreational use (primary contact). Sites will be well-spaced and, where practical, distributed such that there are at least 3 sites for every 5 miles of stream. Due to the significant amount of public input considered during the RUAA, relocation of survey sites may occur without an amendment to the QAPP as noted in the March 2014 *TCEQ Procedures for a Comprehensive RUAA and a Basic RUAA Survey*, but require notification and approval by the TSSWCB PM, who will notify the TCEQ Water Quality Standard Group for their approval. Relocation may include but is not limited to instances when landowner access has changed, new public information regarding survey locations is made

available, or suitability of a previously identified survey location has changed due to lack of access or unsafe conditions.

RUAA survey site selection is predicated on reconnaissance trips, public participation, and stakeholder interaction. An initial reconnaissance trip will be completed prior to meeting with stakeholders about the project, and follow-up trips will occur when interaction with local landowners provides opportunities for additional sites. Two surveys will be conducted at each of the selected sites by TIAER. Each survey will be conducted per the March 2014 version of the *TCEQ Procedures for a Comprehensive RUAA and a Basic RUAA Survey* and will include the collection of transect information along a stretch of the creek at each site documenting the presence or absence of water recreation activities and characteristics regarding stream flow type and pool depths (see Appendix B for RUAA Field Data Sheets). Obstructions, stream color, water surface characteristics, stream trash and observed evidence of wildlife (tracks or fecal material) will be included in the photographic record of each site. Interview survey information will also be collected from individuals either actively recreating at each site or knowledgeable of the site and the project creeks in general (see Appendix C). Each survey will be performed at a time of year under weather and hydrologic conditions that are conducive to observing recreational use, which means when air temperatures are warm to hot (>70° F). Field surveys will be conducted during the period people would most likely be using the water body for contact recreation. A historical information review will be conducted on recreation use that occurred on each creek on and after November 28, 1975.

To ascertain the suitability of the streams for contact recreation use, field surveys shall document hydrological characteristics of the stream, such as flow type, width and depth of channel and substantial pools, bank access, and stream substrate. Information to be collected shall at least satisfy those questions found on the Field Data Sheet from the *TCEQ Procedures for a Comprehensive RUAA and a Basic RUAA Survey* (March 2014). TIAER shall document antecedent rainfall conditions (approximately 30 days prior to fieldwork) and the source of the data per the RUAA procedures. TIAER shall also collect a digital photographic record of each selected site during the field surveys. Photographs shall include upstream, left and right bank, and downstream views clearly depicting the entire channel at each 30-m, 150-m, and 300-m transects. Any evidence of observed uses or indications of human use shall be photographed as well obstructions to use and hydrologic modifications that characterize the water body.

Section B1 contains detailed information on direct data to be collected during the RUAA field surveys. Maps of RUAA site locations are presented in Appendix A.

Information on acquired or non-direct data is addressed in Section B9.

## **A7 Quality Objectives and Criteria**

The project objective is to collect data that may be used to support decisions related to recreational use designation. Data to be collected in the RUAA surveys at each site are listed in *Procedures for a Comprehensive Recreational UAA and a Basic UAA Survey* (March 2014). A copy of the field data sheet is located in Appendix B. Most of the data to be collected is based on observations, such as channel flow status, stream type and recreational activities, or experience of individuals interviewed and not directly measured with an instrument. Direct measurements and quality objectives are indicated below.

Measurements under wadeable conditions include thalweg depth, length and width of substantial pools; and stream width. Thalweg depth should be reported in meters to 2 significant figures. If depths are too deep at a particular transect to measure then thalweg should be reported as >1.5 meters. Stream width should be noted to represent 1) the typical average width of the 300 meter reach; 2) the width at the narrowest point of the stream within the 300 meter reach; and (3) the width at the widest point of the stream within the 300 meter reach. Stream width values should be reported in meters to 2 significant figures.

For substantial pools, the width (at the widest point) and deepest depth of each pool should be reported. A substantial pool is considered a pool greater than 10 meters in length for the purposes of a RUAA Survey. Report pool measurements to 2 significant figures in meters. If depths are too deep to measure then report >1.5 meters.

Measurements on non-wadeable streams, if accessible, should represent typical widths along the 300 meter reach with measurements reported in meters to 2 significant figures.

A photographic record will be made of each site during each survey. Photographs will include an upstream view, left and right bank views, downstream view at 0-m, 150-m, and 300-m transects (as described in the Field Data Sheets), any evidence of recreational uses or indications of human use, hydrologic modifications, etc. Photographs should clearly depict the entire channel and, if feasible, the depth of water in the channel and pools or the absence of water, if dry. Photos should document evidence of recreational use (e.g., rope swings) and actual recreation. No identifiable photographs should be taken of minor children without the permission of an accompanying adult. Efforts should be made not to show the faces of any child (person considered a minor) photographed. Photos may also show a lack of use, such as dry creek beds. Photos need an obvious scale. Photographs must be cataloged in a manner that indicates the site location, date, view orientation and what is being shown.

### **Precision**

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

The precision of the information gathered for this project, because it is largely observations, will be dependent on training of field crew personnel for consistency.

### **Bias**

Bias is a statistical measurement of correctness and includes components of systemic error. A measurement is considered unbiased when the value reported does not differ from the true value. Bias in measurements (both direct and observational) will be addressed through training on obtaining the information required on the RUAA field data sheets to assure consistency within and between field teams.

### **Representativeness**

Representativeness is a measure of how accurately a monitoring program reflects actual water quality conditions and recreational uses. The representativeness of the data is dependent on the sampling locations, the conditions under which surveys are performed, and the survey procedures.

The RUAA surveys will ideally be performed at a frequency of three sites per five stream miles to assure maximum capture of stream recreational uses and conditions. Additionally, sites will be surveyed hydrologically, preferentially during high recreational use potential. Representativeness will be measured with the completion of data collected in accordance with the approved QAPP.

### **Comparability**

Confidence in the comparability of data sets from this project and those for similar uses is based on the commitment of TIAER to use only the methods and QA/QC protocols prescribed in the *Procedures for a Comprehensive Recreational UAA and a Basic UAA Survey* (March 2014) in accordance with quality system requirements and as described in this QAPP.

### **Completeness**

The completeness of the data is basically a function of weather, site access, and the availability and willingness of individual responders. Ideally, 100% of the data should be available. Unavailable data due to weather and the inability to access the sites and interview individuals are to be expected. Therefore, it will be a general goal of the project that 90% data completion is achieved. Interviewing the required contacts, completing the field data sheets and interview forms for each site, and providing the required photographic evidence, maps, and final report will guarantee the completeness of the each data set.

## **A8 Special Training/Certification**

Field personnel will receive training in proper field analysis techniques prior to the RUAA field surveys. Before actual field measurements occur, field personnel will demonstrate to the TIAER Project QAO or designee their ability to properly perform field analysis procedures required on the RUAA field data sheet (see Appendix B). Training will be documented and retained in the TIAER Monitoring Staff Training file and be available during a monitoring systems audit. TIAER staff collecting Global Positioning System (GPS) data will be certified TCEQ and will maintain their certification throughout the project.

## **A9 Documents and Records**

Quarterly progress reports (QPRs) will note activities conducted in connection with the RUAA, items or areas identified as potential problems, and any variations or supplements to the QAPP. Corrective Action Reports (CARs) will be utilized when necessary (see example in Appendix D). CARs that result in any changes or variations from the QAPP will be made known to pertinent project personnel and documented in an update or amendment to the QAPP. All QPR and QAPP revisions will be distributed to personnel listed in Section A3.

The TSSWCB may elect to take possession of records at the conclusion of the specified retention period.

### **RUAA Reports and Forms**

- Information to be collected shall at least satisfy those questions found on Contact Information Form (Appendix C)
- Field Data Sheets and Interview Forms in electronic format (Appendix B and C)
- Digital photographic record, cataloged in an appropriate manner

### **Records and Documents Retention Requirements**

<b><u>Document/Record</u></b>	<b><u>Location at TIAER</u></b>	<b><u>Retention</u></b>	<b><u>Form</u></b>
QAPP, amendments, and appendices	Central Files	5 years	Paper
QAPP distribution documentation	Central Files	5 years	Paper/Electronic
Training records	Central Files	5 years	Paper
Field notebooks or field data sheets	Central Files	5 years	Paper/Electronic
RUAA Contact Information, Field Data, and Interview Forms	Central Files	5 years	Paper/Electronic
Field SOPs	Central Files	5 years	Paper/Electronic
Corrective action documentation	Central Files	5 years	Paper/Electronic

### **Revisions to the QAPP**

Until the work described is completed, this QAPP shall be revised as necessary and reissued annually or revised and reissued within 120 days of significant changes, whichever is sooner.

### **Amendments**

Amendments to the QAPP may be necessary to reflect changes in project organization, tasks, schedules, objectives, and methods; address deficiencies and nonconformances; improve operational efficiency; and/or accommodate unique or unanticipated circumstances. Requests for amendments are directed in writing from the TIAER PM to the TSSWCB PM. Changes are effective immediately upon approval by the TSSWCB PM and QAO.

Amendments to the QAPP and the reasons for the changes will be documented, and revised pages will be forwarded to all persons on the QAPP distribution list by the TIAER QAO.

Amendments shall be reviewed, approved, and incorporated into a revised QAPP during the annual revision process or within 120 days of the initial approval in cases of significant changes.

As per the March 2014 *TCEQ Procedures for a Comprehensive RUAA and a Basic RUAA Survey*, site changes may be made to this QAPP without the need for an amendment. If site changes occur, these changes will be incorporated into a revised QAPP during the annual revision for distribution. Prior to the annual revision, all individuals on the QAPP distribution will be notified of any site changes with an updated site list within 120 days of notification and approval by the TSSWCB PM.

## **B1 Sampling Process Design (Experimental Design)**

TIAER will collect information that can be used to evaluate recreational uses in the study area. Methods used and sampling process design shall be consistent with the TCEQ *Procedures for a Comprehensive RUAA and a Basic RUAA Survey* (March 2014). TIAER will conduct field surveys at selected sites during periods people would most likely use the water body for contact recreation; surveys shall ascertain the suitability of the streams for contact recreation use and shall document the hydrological characteristics of the stream.

Field data will be collected following procedures detailed in *Procedures for a Comprehensive RUAA and a Basic RUAA Survey* (March 2014). Tables B1.1 and B1.2 provide the sites selected for use in the project for each watershed. Maps of the RUAA sites within each watershed are provided in Appendix A showing the location of sites as identified in Tables B1.1 and B1.2. TIAER used respective tax appraisal districts to help identify landowners along each water body and stakeholders within each watershed area.

**White Oak Creek (0303B)** White Oak Creek (0303B) is 119 river miles long, indicating a goal of 71 sites (3 sites per 5 miles of river) for the RUAA survey (Figures Appendix A.2 – Appendix A.5). Forty-one sites are proposed for the RUAA, 31 of which are publically accessible via road crossings (Table B1.1) and 10 of which are accessible via private property.

The White Oak Wildlife Management Area (WMA) is the only park within the White Oak Creek watershed ([http://tpwd.texas.gov/huntwild/hunt/wma/find\\_a\\_wma/list/?id=35](http://tpwd.texas.gov/huntwild/hunt/wma/find_a_wma/list/?id=35)). The majority of the WMA exists within the White Oak Creek watershed, through which approximately 28 miles of creek is open to the public with access primarily by boat. The White Oak WMA is approximately 25,777 acres, with 12,849 acres within the White Oak Creek watershed. The White Oak WMA is managed under a license agreement with the US Army Corps of Engineers and provides outdoor recreation such as hunting, fishing, hiking, horseback riding, and wildlife viewing. Additionally public hunting for specific wildlife is permitted during hunting season. While permission to access White Oak Creek on this property will not be required, TIAER must be granted permission to utilize ATVs when performing RUAA surveys. However, 3 sites per 5 miles of river were attainable via boat access.

According to the WMA Manager, the creek is accessible on foot when the bottomland hardwood forest of the WMA is not inundated by floodwaters either from upstream flow or from backwater from Lake Wright-Patman via the Sulphur River. However, the watershed of White Oak Creek and surrounding areas have received copious amounts of rainfall over the past 12 months causing Lake Wright-Patman to reach maximum capacity and subsequently back up into White Oak Creek. WMA 4-wheel drive and ATV roads were submerged preventing any vehicle traffic through the WMA. During TIAER's reconnaissance, White Oak Creek remained elevated enough to prevent access to the WMA by any means other than boat.

Sites WH01 – WH15 exist within the WMA boundaries. Sites WH01 – WH03 are accessible by deploying a boat at the U.S. Highway 67 Bridge that crosses the Sulphur River and boating approximately 2.5 miles upstream to the confluence of White Oak Creek then continuing up the

creek to these sites. Using Highway 259 as a site and an access point, sites WH04 – WH09 are accessible. Site WH14 was established at the crossing of White Oak Creek and an unnamed road in the WMA at site WH14 from which sites WH10 – WH15 are also accessible by boat.

Public access to White Oak Creek is made available primarily through road crossings and by small boat where water levels and debris permit. Landowners throughout the watershed with river front property were contacted, regarding access to White Oak Creek, for potential RUAA sites. TIAER plans to enter the creek at road crossings associated with sites WH08, WH14, WH19, WH24, WH26, WH28, WH30, WH35, WH39 and WH41. Of the 31 publically accessible sites, six are identified as TCEQ sampling stations (Table B1.1 and Figures Appendix A.2 – Appendix A.5).

The average distance between survey sites is 2.97 river miles and ranges from 12.89 to 0.31 miles. A maximum distance between survey sites of 12.89 river miles exists between WH29 and WH30. The second largest distance between survey sites is 12.24 river miles and exists between WH16 and WH15 on private property. There are 10 major road crossings for the 119-mile stretch of the White Oak Creek. Each of the 10 major road crossings was selected as proposed RUAA survey sites.

According to accounts from local landowners and law enforcement given at public meetings, the stretch of creek between sites WH15 and WH16 (Table B1.1 and Figure Appendix A.2) is owned and/or leased by individuals who are unwelcoming to strangers. It was strongly advised to abstain from travelling through this segment of creek or attempting to contact those in control of the land.

Access to the following locations; river-mile markers 40 and 45, sites WH22 and WH23, sites WH25 and WH26, river-mile markers 80 through 90, and river-mile markers 100 and 105, is extremely limited by dense forest vegetation and lack of any trails or roads leading to the creek or its vicinity. Landowner contacts were successful in some of these areas. However, the TIAER field crew encountered either no existing roads through the forest vegetation to the creek, or nearly vertical, very slick and steep banks with depths reported by the landowner of being greater than 1.5 m.

Due to adequate water levels in the creek during reconnaissance, navigating White Oak Creek using an aluminum, flat-bottomed boat with a 5 Horse Power, gasoline motor was possible. Consequently, when water levels are adequate for navigation by boat the flow rate in White Oak Creek inhibits any upstream navigation by man-power alone (i.e. paddling). Navigation upstream and downstream from the public road crossings was possible until travel was obstructed by log jams and submerged tree debris in the channel. Non-wadeable depths and steep and densely vegetated banks were consistently encountered throughout the creek; therefore, continuing beyond obstructions was impossible without having to swim. These conditions prohibit wading, deployment of a boat, and/or walking along the banks.

Due to the long stretch of the waterbody, there were two public meetings held to introduce the RUAA to stakeholders. The identical public meetings were held on April 4, 2016 in Sulphur Springs, Texas, and April 5, 2016 in Mount Pleasant, Texas. These meetings were advertised in local

newspapers. Mailings went out to 133 individuals within the White Oak Creek watershed and of these individuals, 13 attended the April 4<sup>th</sup> meeting and 4 attended the April 5<sup>th</sup>. In addition, during site reconnaissance trips, landowners and stakeholders were approached if seen near the river (TIAER field crew did not enter gated and/or locked entrances).

There are five municipal wastewater treatment facilities (WWTFs) within White Oak Creek watershed, one for each of the Cities of Sulphur Springs, Mount Vernon, and Mount Pleasant, and two for the Luminant Mining Company, LLC (Figure Appendix A.2). The largest permitted discharge is the City of Sulphur Springs with a permitted average daily flow of 5.4 MGD. The smallest permitted discharge is with Luminant Mining Company, LLC (WQ0004122000) with a permitted average daily flow of 0.0026. One Luminant Mining Company, LLC WWTF is located on State Highway 11 approximately 2.5 miles from the intersection of Interstate 30 in Hopkins County. The other is located between the City of Winfield in Titus County and the City of Mount Pleasant in Franklin County. This WWTF (TPDES Permit WQ0002697000) directly discharges into 18 different waterbodies. While none of the five WWTF discharge directly into White Oak Creek, all discharges eventually flow into White Oak Creek.

There are 12 active general permits and five either expired or canceled general permits for concentrated animal feeding operations (CAFO) within the White Oak Creek watershed (Figure Appendix A.2). Of the 12 active general permits, 10 are located in Hopkins County. Two active CAFO permits are in Franklin County. There are no active, expired, or canceled CAFO permits in Titus or Morris Counties.

**Table B1.1. White Oak Creek RUAA Sites. Sites are listed in downstream to upstream order along the segment.**

Site ID	TCEQ Station	Site Description	Latitude	Longitude	Distance from Confluence (mi) <sup>[1]</sup>	Distance from Previous Site (mi)	Access
<b>WH01</b>		White Oak Creek about 1.09 miles from the confluence with the Sulphur on White Oak Creek Wildlife Management Area	33.267436	-94.659874	1.09	NA	Public
<b>WH02</b>		White Oak Creek about 2.25 miles from the confluence with the Sulphur on White Oak Creek Wildlife Management Area	33.261746	-94.670954	2.25	1.16	Public
<b>WH03</b>		White Oak Creek about 3.46 miles from the confluence with the Sulphur on White Oak Creek Wildlife Management Area	33.264756	-94.684989	3.46	1.21	Public
<b>WH04</b>		White Oak Creek about 4.61 miles downstream from State Highway 259 on White Oak Creek Wildlife Management Area	33.252703	-94.710904	6.09	2.63	Public
<b>WH05</b>		White Oak Creek about 3.36 miles downstream from State Highway 259 on White Oak Creek Wildlife Management Area	33.2619509	-94.725684	7.99	1.90	Public
<b>WH06</b>		White Oak Creek about 2.11 miles downstream from State Highway 259 on White Oak Creek Wildlife Management Area	33.263947	-94.723664	8.59	0.60	Public
<b>WH07</b>		White Oak Creek about 0.84 mile downstream from State Highway 259 on White Oak Creek Wildlife Management Area	33.272075	-94.733321	9.86	1.27	Public
<b>WH08</b>	<b>10198</b>	White Oak Creek at State Highway 259, approximately 7.5 miles north of Omaha, Texas	33.27536	-94.74208	10.70	0.84	Public

Site ID	TCEQ Station	Site Description	Latitude	Longitude	Distance from Confluence (mi) <sup>[1]</sup>	Distance from Previous Site (mi)	Access
WH09		White Oak Creek about 1.81 miles upstream from State Highway 259 on White Oak Creek Wildlife Management Area	33.2735777	-94.7570032	11.98	1.28	Public
WH10		White Oak Creek about 6 miles upstream from State Highway 259 and about 1.04 miles downstream from Interstate Highway 30 on White Oak Creek Wildlife Management Area	33.271589	-94.798303	16.67	4.69	Public
WH11		White Oak Creek at Interstate Highway 30, about 21.8 miles northeast of Mt. Pleasant, Texas	33.2773325	-94.8081694	17.90	1.23	Public
WH12		White Oak Creek 1.7 miles upstream from Interstate Highway 30 on White Oak Creek Wildlife Management Area	33.285503	-94.812513	19.43	1.54	Public
WH13		White Oak Creek 2.5 miles upstream from Interstate Highway 30 on White Oak Creek Wildlife Management Area	33.290267	-94.819745	20.18	0.75	Public
WH14	16697	White Oak Creek at a WMA road crossing about 1.06 miles east of County Road 3445 and about 3.3 miles upstream from Interstate Highway 30 on White Oak Creek Wildlife Management Area	33.300526	-94.82203	21.01	0.83	Public
WH15		White Oak Creek about 4 miles upstream from Interstate Highway 30 on White Oak Creek Wildlife Management Area	33.308105	-94.828454	21.80	0.79	Public
WH16		White Oak Creek on private property, about 4.2 miles downstream from Farm Road 1402	33.324322	-94.922892	34.04	12.25	Private

Site ID	TCEQ Station	Site Description	Latitude	Longitude	Distance from Confluence (mi) <sup>[1]</sup>	Distance from Previous Site (mi)	Access
WH17		White Oak Creek on private property, about 3.46 miles downstream from Farm road 1402	33.321566	-94.932182	35.38	1.33	Private
WH18		White Oak Creek on private property, about 0.72 mile downstream from Farm road 1402	33.313244	-94.946892	37.51	2.13	Private
WH19	21412	White Oak Creek at Farm Road 1402	33.312135	-94.957039	38.23	0.72	Public
WH20		White Oak Creek about 0.33 mile downstream from County Road 1905	33.309373	-95.019592	46.35	8.12	Public
WH21		White Oak Creek at County Road 1905	33.308772	-95.022148	46.68	0.33	Public
WH22		White Oak Creek about 0.44 mile upstream from County Road 1905	33.311237	-95.025817	47.12	0.44	Public
WH23		White Oak Creek about 1.3 miles downstream from US Highway 271	33.322083	-95.079082	53.45	6.32	Public
WH24	10199	White Oak Creek at US Highway 271	33.322687	-95.092707	54.71	1.27	Public
WH25		White Oak Creek about 0.76 mile upstream from US Highway 271	33.325546	-95.101859	55.47	0.76	Public
WH26		White Oak Creek at County Road 2100	33.288349	-95.188892	67.06	11.59	Public
WH27		White Oak Creek about 0.48 mile downstream from State Highway 37	33.274986	-95.235207	74.25	7.18	Public
WH28		White Oak Creek at State Highway 37	33.272477	-95.238465	74.73	0.48	Public
WH29		White Oak Creek on private property about 5.15 miles upstream from State Highway 37	33.265667	-95.271596	79.88	5.15	Private
WH30	10201	White Oak Creek at Farm Road 900	33.234268	-95.360116	92.77	12.89	Public

Site ID	TCEQ Station	Site Description	Latitude	Longitude	Distance from Confluence (mi) <sup>[1]</sup>	Distance from Previous Site (mi)	Access
WH31		White Oak Creek on private property about 6 miles upstream from Farm Road 900	33.211149	-95.411175	98.94	6.17	Private
WH32		White Oak Creek on private property about 4.4 miles downstream from Farm Road 69	33.18011	-95.43669	103.89	4.96	Private
WH33		White Oak Creek on private property about 2.79 miles downstream from Farm Road 69	33.18011	-95.45481	105.51	1.62	Private
WH34		White Oak Creek on private property about 2.1 miles downstream from Farm Road 69	33.17614	-95.4655	106.19	0.69	Private
WH35	20099	White Oak Creek at Farm Road 69	33.16956	-95.4936	108.30	2.11	Public
WH36		White Oak Creek on private property about 0.31 mile downstream from County Road 3504	33.17292	-95.537936	112.48	4.18	Private
WH37		White Oak Creek at County Road 3504	33.173388	-95.54268	112.79	0.31	Public
WH38		White Oak Creek on private property about 2.2 miles upstream from County Road 3504	33.177261	-95.561811	115.01	2.22	Private
WH39		White Oak Creek at State Highway 19	33.181152	-95.589948	117.50	2.49	Public
WH40		White Oak Creek on right-of-way about 0.52 mile downstream from Farm Road 2285	33.176947	-95.610735	119.48	1.98	Public
WH41		White Oak Creek at Farm Road 2285	33.179921	-95.617829	120.00	0.52	Public

<sup>1</sup> Distances were digitally estimated using the measuring tool in ArcGIS 9.3 with the 2010 NAIP 1m DOQQs and the NHD stream layer as reference guides.

### **South Lilly Creek (0409B)**

South Lilly Creek (0409B) is 15.2 river miles long indicating a goal of nine sites (3 sites per 5 miles of river) for the RUAA survey (Figure Appendix A.6). TIAER currently has nine proposed survey sites, seven of which are located at public road crossings and two are accessible via private property (Table B1.2). A concerted effort was made to contact landowners up and downstream of these public access points to make sure they would allow access to their land. This was done because although road crossings are public access points, private lands may need to be accessed to complete the full 300 m reach for each RUAA field survey. There are no parks located along South Lilly Creek or within the watershed area.

Public participation was also solicited at a public meeting held in Pittsburg, Texas to discuss the upcoming RUAA survey. Mailings went out to 105 individuals within the watershed area and of these, seven people attended the meeting. The public meeting was also advertised in local newspapers. To determine individuals within the South Lilly Creek watershed, TIAER utilized county records for Wood, Camp, and Upshur Counties.

During the public meeting, a landowner within the upstream region of South Lilly Creek was contacted directly. The landowner agreed to allow TIAER river access to complete the two RUAA surveys. Sites SL02 and SL03 are the only proposed private access RUAA survey sites.

The average distance between survey sites is 1.21 river mile and ranges from 0.83 miles to 2.57 miles. The largest gap of miles is between sites SL05 and SL06. The second largest gap of 1.76 river miles is between sites and at TCEQ Station. These gaps seemed reasonable given the RUAA goal of nine sites (3 sites per 5 miles of river) were obtained. Thus, additional efforts were not made to procure RUAA sites between these locations. Sites SL01 and SL07 are TCEQ water quality monitoring locations (Figure Appendix A.6).

There are no waste water treatment facilities (WWTFs) or Concentrated Animal Feeding Operations (CAFOs) within the South Lilly watershed.

**Table B1.2. South Lilly Creek (0409B) RUAA Sites. Sites are listed in downstream to upstream order along the water body**

Site ID	TCEQ Station	Site Description	Latitude	Longitude	Distance from Confluence (mi) <sup>1</sup>	Distance from Previous Site (mi) <sup>1</sup>	Access
SL01	17954	South Lilly Creek at FM 2454 about 1.8 KM south of the intersection with FM 556 and Southwest of Pittsburg	32.896232	-95.025195	2.04	0.00	Public*
SL02		South Lilly Creek at FM 556	32.889277	-95.066208	3.80	1.76	Public
SL03		On private property about 1.12 miles West of FM 556	32.889346	-95.065568	4.92	1.12	Private
SL04		On private property about 0.99 miles East of Raccoon Road	32.889511	-95.076858	5.76	0.84	Private
SL05		South Lilly Creek at Raccoon Road	32.884187	-95.087282	6.74	0.98	Public
SL06		South Lilly Creek at Squirrel Road	32.892161	-95.114051	9.31	2.57	Public*
SL07	17953	South Lilly Creek at Woodchuck Road 3.11 KM downstream of FM 1647 and 15.3 KM south of Lake Cypress Springs	32.885961	-95.135272	10.91	1.59	Public*
SL08		South Lilly Creek at Waterbuck Road	32.885662	-95.147420	11.74	0.83	Public*
SL09		South Lilly Creek at FM 1647	32.892469	-95.160094	12.90	1.16	Public*

<sup>1</sup> Distances were digitally estimated using the measuring tool in ArcGIS 9.3 with the 2010 NAIP 1m DOQQs and the NHD stream layer as reference guides.

\*Site was publically accessible at the bridge crossing only. Private property fencing was crossed to complete the full 300 m RUAA survey.

## **B2 Sampling Methods**

### **Field Sampling Procedures**

The sampling process design will be based on the *Procedures for a Comprehensive RUAA and a Basic RUAA Survey* (March 2014). For the RUAA field surveys, information to be collected shall at least satisfy those questions found on the Field Data Sheet from the TCEQ *Procedures for a Comprehensive RUAA and a Basic RUAA Survey* (March 2014) in Appendix B. The RUAA surveys shall be conducted during a normal warm season (air temperature greater than or equal to 70°F) during dry weather flows that are not storm influence and performed during the period when people would be most likely to use the water body for contact recreational purposes (examples: Saturdays & Sundays, holidays, and summer). In Texas, this period is typically May to September.

The RUAA survey field data sheets must be completed for each site. All field data gathered must be recorded in the appropriate locations on the field data sheets. Field data sheets may be recorded in indelible ink (preferred) or pencil with no erasures, modifications, write-overs or multi-line crossouts.

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

Field sampling activities will be documented on the Field Data Sheets (see Appendix B). For all visits, stream name, site, date, time, and sample name of collector(s) shall be recorded. Values for all required field parameters will be recorded including detailed observational data as required on the RUAA Field Data Sheets. Data may be transferred to electronic Field Data Sheets from the hard copies for storage and improved legibility, but the original maintained.

### **Recording Data**

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

1. Legible writing in indelible, waterproof ink with no modifications, write-over's or cross-outs;
2. Changes should be made by crossing out original entries with a single line, entering the changes, and initialing and dating the corrections.
3. Close-outs on incomplete pages with an initialed and dated diagonal line.

### **Deficiencies, Nonconformances and Corrective Action Related to Sampling Requirements**

Deficiencies are defined as unauthorized deviation from procedures documented in the QAPP. Nonconformances are deficiencies which affect quality and render the data unacceptable or indeterminate. Deficiencies related to sampling method requirements include, but are not limited to, such things as sample site adjustments.

Deficiencies are documented in logbooks, field data sheets, etc. by field staff and reported to the TIAER Field Operations Manager who will notify the appropriate TIAER Project Coordinator. The TIAER Project Coordinator in consultation with the TIAER Project QAO and TIAER PM

will determine if the deficiency constitutes a nonconformance. If it is determined the activity or item in question does not affect data quality and therefore is not a valid nonconformance, the deficiency worksheet will be completed accordingly. If it is determined a nonconformance does exist, the TIAER Project QAO in consultation with TIAER PM will determine the disposition of the nonconforming activity or item and necessary corrective action(s); results will be documented by completion of a CAR (Appendix D).

CARs document: root cause(s); programmatic impact(s); specific corrective action(s) to address the deficiency; action(s) to prevent recurrence; individual(s) responsible for each action; the timetable for completion of each action; and, the means by which completion of each corrective action will be documented. CARs will be included with quarterly progress reports. In addition, significant conditions (i.e., situations which, if uncorrected, could have a serious effect on safety or on the validity or integrity of data) will be reported to the TSSWCB immediately both verbally and in writing.

### **B3 Sample Handling and Custody**

#### **Sample Handling**

Sample parameters for this project are recorded *in situ*. No physical samples are collected, so this section is not applicable.

## **B4 Analytical Methods**

### **Failures in Measurement Systems and Corrective Actions**

Failures in field measurement systems involve, but are not limited to, such things as instrument malfunctions. In many cases, the field technician will be able to correct the problem. If the problem is resolvable by the field technician, then they will document the problem on the field data sheet and complete the measurement. If the problem is not resolvable, then it is conveyed to the TIAER Project QAO through initiation of a CAR. The nature and disposition of the problem is reported to the TIAER PM, who will include this information in the CAR and submit with the QPR which is sent to the TSSWCB PM.

## **B5 Quality Control**

Sample data for this project are recorded *in situ*. No physical samples are collected, so this section is not applicable.

## **B6 Instrument/Equipment Testing, Inspection and Maintenance**

Field equipment is inspected and tested by TIAER upon receipt to assure it is appropriate for use. No specific equipment is required by this project to conduct the RUAA field surveys.

## **B7 Instrument/Equipment Calibration and Frequency**

Sample data collected for this project do not require any instruments or equipment requiring calibration, so this section is not applicable.

## **B8 Inspection/Acceptance of Supplies and Consumables**

All new batches of field supplies are inspected before use to ensure that they are adequate for the intended purpose. Extra supplies, such as camera for taking pictures during the RUAA field surveys, will be kept and made available to the project by the Field Supervisors.

## **B9 Non-direct Measurements**

Information generated from the following tasks, which are included in the overall project contract, may be used to identify sites for RUAA data collection:

- A comprehensive GIS inventory of the study area.
- Reconnaissance trip(s) to assess potential survey sites.
- Public meetings for solicitation of landowner permission for access to survey sites.
- Historical information review of recreational uses of the water body since November 1975.

### **Comprehensive GIS Inventory**

As part of the project for site selection and source identification, a comprehensive GIS survey will be compiled for the study area. All data to be used in the GIS survey for this project have been collected in accordance with approved QA measures under the TCEQ, Texas Water Development Board, USDA, and USGS. GIS data to be used include, but are not limited to, SSURGO and CBMS soils data, USGS NLCD and NHD, Census data (2000), Census of Agriculture data from USDA NASS (2007), and the United States Geological Survey (USGS) 30-meter resolution DEM (Table B9.1). Depending on the accessibility to the GIS layers from different data sources, efforts will be made to update the spatial data to the most recently available data. Also, as other relevant data sources become known, they may be added to the GIS Inventory.

As part of the project, TIAER will conduct a historical data review for each water body in order to assess and characterize trends and variability specifically of bacteria, but may also include other water quality parameters. The historical data collection activities will focus on ambient water quality data and may include streamflow and water level data, precipitation records, and data from permitted facilities including discharges and effluent quality. Data sources may include the USGS, National Weather Service, Texas Parks and Wildlife Department, Texas Water Development Board, Groundwater Conservation Districts, relevant River Authorities, TCEQ, and the EPA.

As part of the field RUAA surveys, historical weather data, specifically weather day for the 30 days prior to each field RUAA survey, will be obtained from the National Weather Service or other reliable source.

Because most non-direct data are of known and acceptable quality and were collected and analyzed in a manner comparable and consistent with needs for this project, no limitations will be placed on their use, except where known deviations have occurred.

**Table B9.1 Non-Direct (Acquired) Data Required for Site Selection and Characterization of each Watershed**

<b>Data Type</b>	<b>Data Source</b>	<b>Applicable Date or Other Attributes</b>	<b>Use/Relevance</b>
Aerial photography	USDA Farm Service Agency NAIP	2004-2010	Site Selection and landscape characteristics
Routine ambient water quality data: primarily bacteria, but also other parameters deemed relevant to a particular water body	TCEQ website in SWQMIS and/or associated River Authority	Full historical data range (1970s – present)	Background information on water quality and trends
DEMs 10-m resolution; GIS data	EPA-BASINS website preferred; webGIS, USGS National Seamless Server and GeoCommunity websites as alternatives. [Large data volume.]	N/A	Delineation of watershed boundaries and boundaries of assessment units
Agricultural census data	USDA NASS website	County level agricultural statistics (2012 data)	Potential sources
Soils data; GIS data (SSURGO)	NRCS website; SSURGO databases [Large data volume]	SSURGO is the most detailed soil maps developed by NRCS	Landscape characteristics
Daily streamflow, if available	USGS web site. [Large data volume.]	Streamflow 1970s to present	Flow characteristics
Municipal & Industrial WWTF permits	TCEQ	TPDES/NPDES permit	Location and type of discharges to each water body
Municipal & Industrial WWTF data (monthly discharged flow and any pertinent quality data associated with discharges)	TCEQ Information Resources Division data and EPA ECHO website (EPA ICIS-NPDES). [Small data volume. DMR provided by permit holders.]	Limited DMR data available from EPA website; more complete records from TCEQ; preferred data range 1970s to present	Flow characteristics and potential sources
Miscellaneous	TNRIS; North Carolina	N/A	Location of

<b>Data Type</b>	<b>Data Source</b>	<b>Applicable Date or Other Attributes</b>	<b>Use/Relevance</b>
geographic data (roads, streams, boundaries, etc.) [Required for physical presentation of maps in reports, largely not needed for modeling.]	State Univ. Libraries geospatial data services website; USGS NHD; U.S. Census Bureau website; Montana State University Geographic Locater website. [Large data volume.]		potential recreational areas along each water body (road crossings, parks, etc) and general watershed characteristics
Precipitation and air temperature data	National Weather Service	Historical for evaluation of normal conditions and for RUAA surveys daily data 30 days prior and during each field survey	Characterization of historical conditions and antecedent and current conditions associated with RUAA field surveys

## **B10 Data Management**

TIAER will collect, store electronically, and make all collected project data available to the TSSWCB PM. TIAER will also be responsible for maintaining backup files to protect the data. Data will be stored, managed and submitted to TSSWCB through the TIAER PM. RUAA data will not go into TCEQ's SWQMIS database. The data will be accompanied by other deliverables, such as a final RUAA report. Deliverables will be submitted to the TSSWCB as described in the contract.

TIAER recordkeeping and document control procedures are contained in the TIAER Standard Operating Procedures (SOPs) for monitoring staff. Original field data sheets are stored in the main office of the TIAER Field Staff.

TIAER will complete Field Data Sheets for the Basic RUAA, Contact Information Forms, and Comprehensive RUAA Interview Forms by hand on hard copies. Information on the forms will be entered into electronic versions at the TIAER office in a directory specifically designated for the project that is backed up incrementally every evening and completely once a week. A TIAER staff member other than the person who electronically entered the data will review at least 10 percent of the survey information in the database against the original hard copies. TIAER staff members will enter data electronically onto the RUAA Summary Sheet into the project directory. Photographs will be taken according to guidelines in the Procedures for a Comprehensive RUAA and a Basic RUAA Survey. The photographs will be taken by an electronic camera and stored in a .jpg format in the project directory.

### **Hardware and Software Requirements**

Hardware configurations are sufficient to run Microsoft Access under the Windows Server operating system in a networked environment. Information resources staff is responsible for assuring hardware configurations meet the requirements for running current and future data management/database software as well as providing technical support. Software development and database administration are also the responsibility of the information resources department. Information resources develop applications based on user requests and assure full system compatibility prior to implementation.

## C1 Assessments and Response Actions

**Table C1.1 Assessments and Response Actions**

Assessment Activity	Approximate Schedule	Responsible Party	Scope	Response Requirements
Status Monitoring Oversight, etc.	Continuous	TIAER PM and Coordinators	Monitoring of the project status and records to ensure requirements are being fulfilled.	Report to TSSWCB in QPRs
Monitoring Systems Audit	At least once per life of the project; dates to be determined by TSSWCB	TSSWCB QAO	The assessment will be tailored in accordance with objectives needed to assure compliance with the QAPP. Field measurement; facility review; and data management as they relate to the project	30 days to respond in writing to the TSSWCB to address corrective actions
Monitoring Systems Audit	Based on work plan and/or discretion of TIAER	TIAER Project QAO	The assessment will be tailored in accordance with objectives needed to assure compliance with the QAPP. Field measurement; facility review; and data management as they relate to the project	30 days to respond in writing to the TIAER Project QAO to address corrective actions
Site Visit	At least once per fiscal year; dates to be determined by TSSWCB	TSSWCB PM and Coordinators	Status of activities. Overall compliance with work plan and QAPP	As needed

### Corrective Action

The TIAER Project QAO is responsible for implementing and tracking corrective action procedures as a result of audit findings. Records of audit findings and corrective actions are maintained by both the TSSWCB PM and the TIAER Project QAO.

Corrective action documentation will be submitted to the TSSWCB PM with the QPR. If audit findings and corrective actions cannot be resolved, then the authority and responsibility for terminating work is specified in agreements or contracts between participating organizations.

## **C2 Reports to Management**

### **Reports to TSSWCB Project Management**

All reports detailed in this section are contract deliverables that will be transferred from TIAER and to TSSWCB in accordance with contract requirements.

Quarterly Progress Report – Summarizes TIAER activities for each task; reports problems, delays, and corrective actions; and outlines the status of each task’s deliverables.

Technical Report – Summarizes TIAER activities for the entire project period including a description and documentation of major project activities; evaluation of the project results and environmental benefits. Technical Report shall at least include those contents described for a Comprehensive RUAA in the TCEQ *Procedures for a Comprehensive RUAA and a Basic RUAA Survey* (March 2014).

- Electronic copies of completed interview forms, field data sheets, flow sheets, and RUAA summary sheet;
- Digital photographic record, cataloged for appropriate identification
- Individual Technical Reports summarizing historical information review, field surveys, and user interviews with water bodies grouped by Basin.

### **Reports to TIAER Project Management**

Progress on project deliverables and any problems or issues concerning project activities are noted in routine staff meetings conducted by the TIAER PM with the Project Coordinators. CARs are the primary mechanism for communicating significant QA issues to management.

## **D1 Data Review, Verification, and Validation**

The TIAER Project Coordinators will review data collected during each RUAA survey for completeness and accuracy as described in Section D2.

## **D2 Verification and Validation Methods**

The TIAER Project Coordinators are responsible for reviewing surveys for completeness and accuracy. At least 10% of survey data in electronic RUAA field data sheets and interview forms should be verified for accuracy against the original handwritten values in field notebooks, field data sheets and interview forms.

### **D3 Reconciliation with User Requirements**

The overall goal of the project is to collect data that provide stakeholders and agencies with sufficient information to determine recreational use status for the two creeks addressed in this project.

**Appendix A: Area Location and RUAA Station Maps by Watershed**



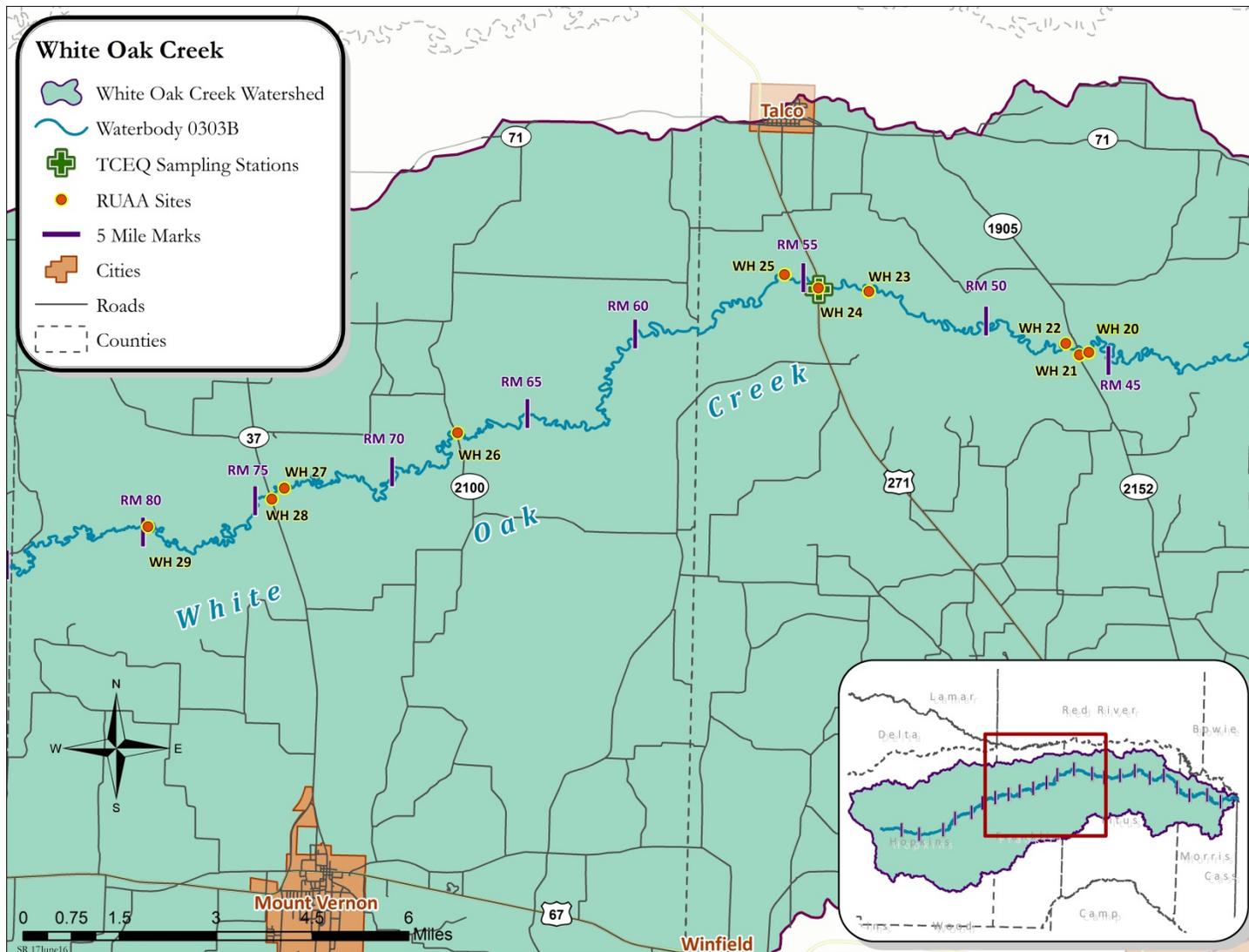
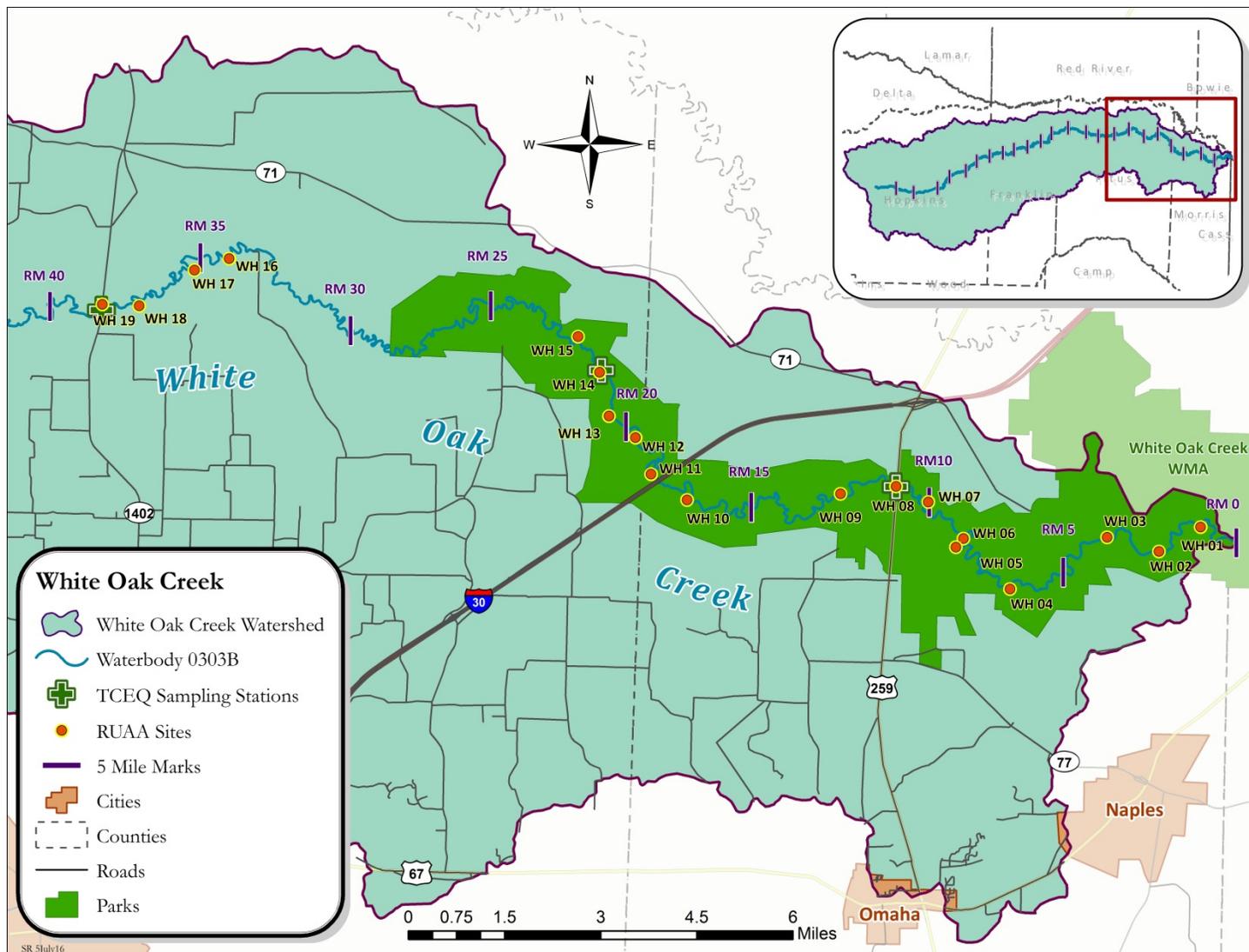
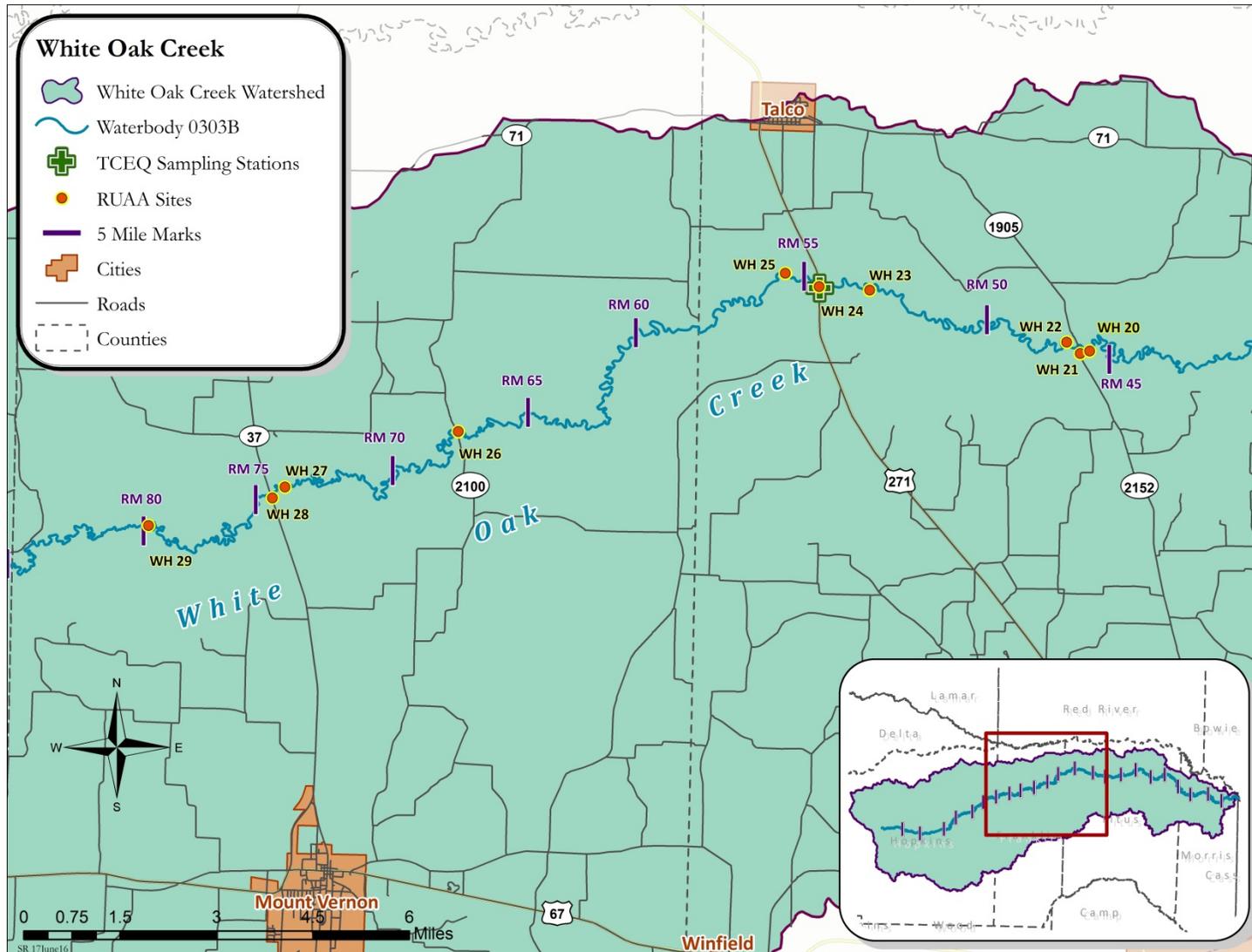


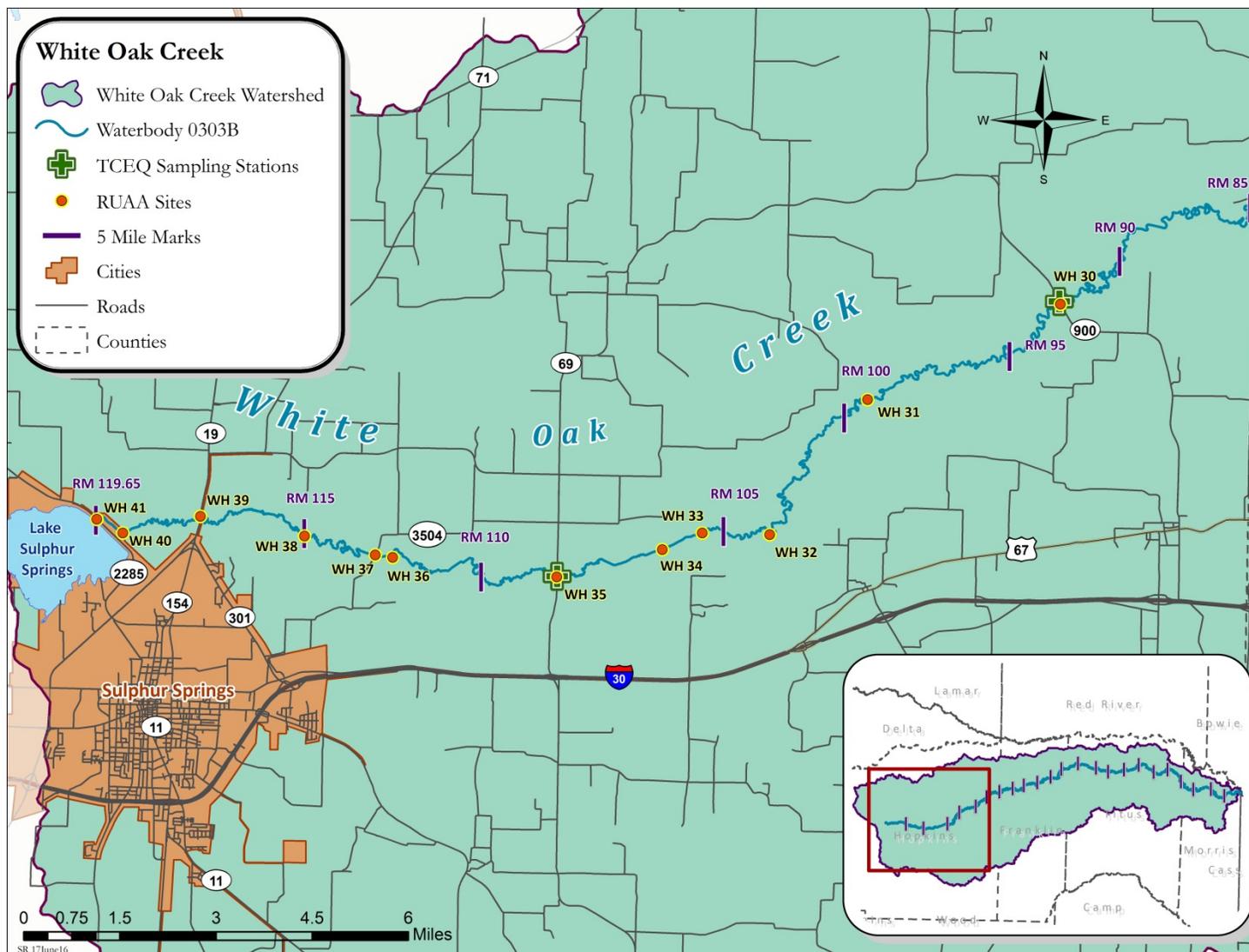
Figure Appendix A.2. RUAA survey sites for White Oak Creek (0303B). RUAA sites correspond to site descriptions in Table B1.1.



**Figure Appendix A.3. RUAA survey sites for White Oak Creek (0303B) – East. RUAA sites correspond to site descriptions in Table B1.1.**



**Figure Appendix A.4. RUAA survey sites for White Oak Creek (0303B) – Central. RUAA sites correspond to site descriptions in Table B1.1.**



**Figure Appendix A.5. RUAAs survey sites for White Oak Creek (0303B) – West. RUAAs sites correspond to site descriptions in Table B1.1.**

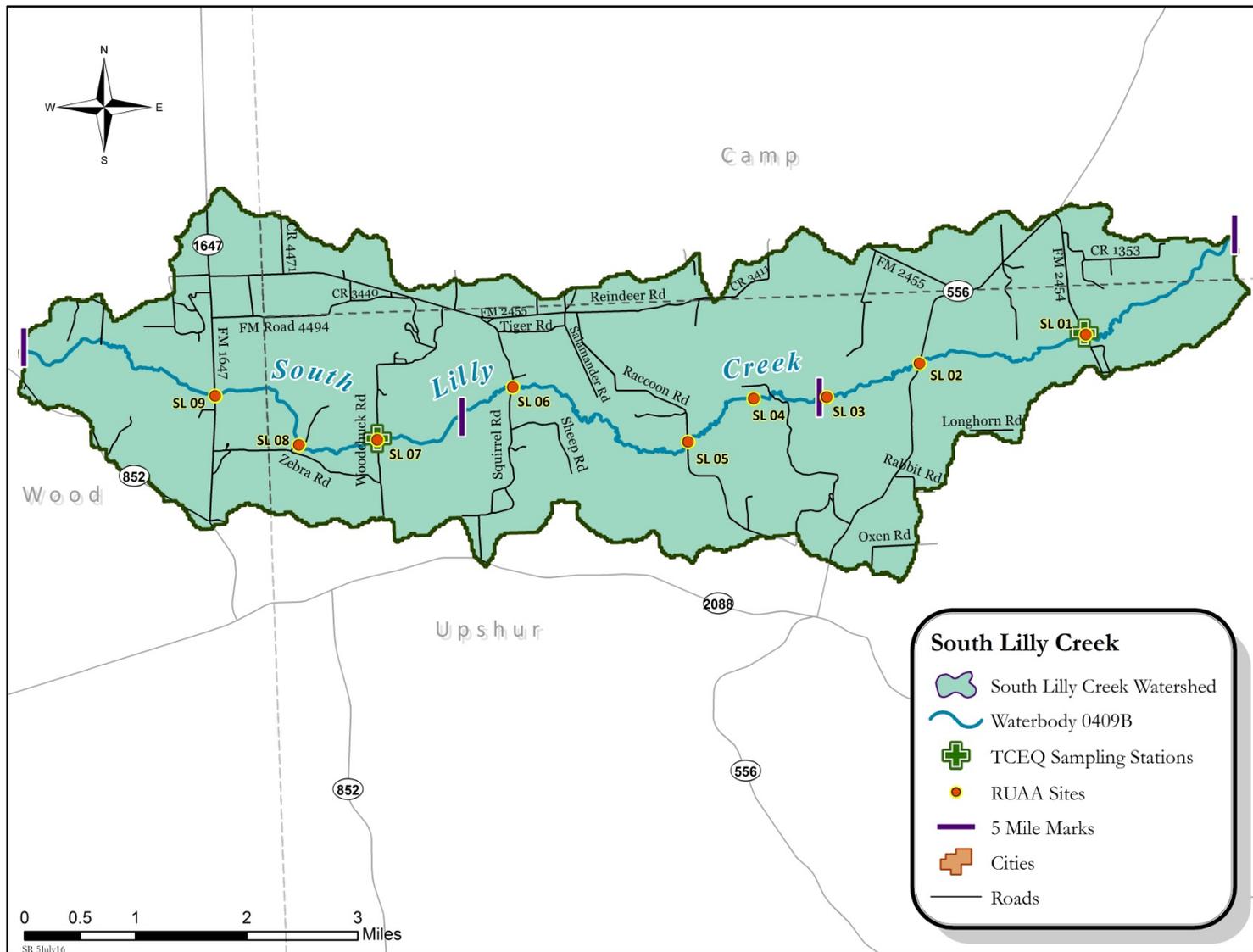


Figure Appendix A.6. RUAA survey sites for South Lilly Creek (0409B). RUAA sites corresponds to site descriptions in Table B1.2.

**Appendix B: RUAA Field Data Sheets**

**Field Data Sheets –RUAA Survey**  
 (complete for each site)

Site:

Data Collectors & Contact Information:	
Date & Time:	County Name:
Stream Name:	
Segment No. or nearest downstream Segment No.:	
Description of Site:	

**A. Stream Characteristics:**

1. Check the following channel flow status that applies.

- dry    no flow    low    normal    high    flooded

2. Check the following stream type that applies on the day of the survey:

Ephemeral: A stream which flows only during or immediately after a rainfall event, and contains no refuge pools capable of sustaining a viable community of aquatic organisms.

Intermittent: A stream which has a period of zero flow for at least one week during most years. Where flow records are available, a stream with a seven-day, two-year low-flow (7Q2) flow of less than 0.1 cubic feet per second is considered intermittent.

Intermittent w/ perennial pools: An intermittent stream which maintains persistent pools even when flow in the stream is less than 0.1 cubic feet per second.

Perennial: A stream which flows continuously throughout the year. Perennial streams have a 7Q2 equal to or greater than 0.1 cubic feet per second.

Designated or unclassified tidal stream: A stream that is tidally influenced. If you checked this box, you will need to contact the TCEQ Water Quality Standards Group and evaluate whether or not a bathing beach is located along the tidal stream and whether or not a bathing beach is located along the estuary, bay or Gulf water that the tidal stream flows into.

3. Riparian Zone (Mark dominant categories with L (Left Bank) and R (Right Bank). Bank orientation is determined by the investigator facing downstream.)

- |                                 |                           |                        |
|---------------------------------|---------------------------|------------------------|
| _____ Forest                    | _____ Urban               | _____ Rip rap          |
| _____ Shrub dominated corridor  | _____ Pasture             | _____ Concrete         |
| _____ Herbaceous marsh          | _____ Row crops           | Other (specify): _____ |
| _____ Mowed/maintained corridor | _____ Denuded/Eroded bank |                        |

4. Ease of bank access to the water body:  Easy    Moderately easy    Moderately difficult    Difficult

5. Please describe access opportunities or explain why the site is not easily accessible (Attach photos for documentation):

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6. Dominant Primary Substrate

- Cobble    Sand    Silt    Mud/Clay    Gravel    Bedrock    Rip rap    Concrete

### Field Data Sheets –RUA Survey

Stream Name \_\_\_\_\_ Site: \_\_\_\_\_  
Date: \_\_\_\_\_ Time: \_\_\_\_\_

#### B. Primary Contact Water Recreation Evaluation:

- Primary contact recreation definition: Activities that are presumed to involve a significant risk of ingestion of water (e.g. wading by children, swimming, water skiing, diving, tubing, surfing, and the following whitewater activities: kayaking, canoeing, and rafting).

1. Were water recreation activities that involve a significant risk of ingestion (full body immersion) observed at this site?

Yes  No primary contact recreation activities were observed

a. Check the following boxes of primary contact recreation activities observed at the time of the sampling event at the site (Attach photos of the activities or lack of activities).

- |  |   |
|--|---|
| <input type="checkbox"/> Wading-Children | <input type="checkbox"/> Tubing   |
| <input type="checkbox"/> Wading-Adults   | <input type="checkbox"/> Surfing  |
| <input type="checkbox"/> Swimming        | <input type="checkbox"/> Whitewater-kayaking, canoeing, rafting   |
| <input type="checkbox"/> Water skiing    | <input type="checkbox"/> Other : _____  |
| <input type="checkbox"/> Diving          | <input type="checkbox"/> frequent public swimming-created by publicly owned land or commercial operations |

b. Check the number of individuals observed at the site:  None  1-10  11-20  20-50  greater than 50

c. Check the following that apply regarding the individuals proximity to the water body.

- Water in mouth or nose of the individual  Primary touch: Individual's body (or portion) immersed in water  
 Secondary touch: fishing, pets and related contact with water  Individual is in a boat touching water  
 Individual is on shore near water within 8 meters (25ft) of water  Individual is well away from water between 8 and 30 meters (100 ft)  Not applicable

2. If primary contact recreation activities are not observed, describe the physical characteristics of the water body that may hinder the frequency of primary contact (depth, etc.) (Attach photos, etc. for documentation).

\_\_\_\_\_

\_\_\_\_\_

3. Describe if there is public access (e.g. parks, roads, etc.) (Attach photos, maps, etc. for documentation).

\_\_\_\_\_

\_\_\_\_\_

4. Is an area with primary contact recreation activities or a bathing beach (e.g. state/local parks with swimming, etc.) located near (e.g. within 5 miles upstream and downstream) this site?

\_\_\_\_\_

\_\_\_\_\_

#### C. Secondary Contact Water Recreation Evaluation:

- Secondary contact recreation 1: Activities that commonly occur but have limited body contact incidental to shoreline activity (e.g. fishing, canoeing, kayaking, rafting and motor boating). These activities are presumed to pose a less significant risk of water ingestion than primary contact recreation but more than secondary contact recreation 2.

- Secondary contact recreation 2: Activities with limited body contact incidental to shoreline activity (e.g. fishing, canoeing, kayaking, rafting and motor boating) that are presumed to pose a less significant risk of water ingestion than secondary contact recreation 1. These activities occur less frequently than secondary contact recreation 1 due to physical characteristics of the water body or limited public access.

### Field Data Sheets –RUA Survey

Stream Name: \_\_\_\_\_ Site: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_

1. Were water recreation activities observed at the site, but the nature of the recreation does not involve a significant risk of ingestion (e.g. secondary contact recreation activities)?  Yes  No secondary contact recreation activities were observed

a. Check the following boxes of secondary contact recreation activities that were observed at the time of the sampling event at the site (Attach photos of activities or lack of activities).

- Fishing
- Boating-commercial, recreational
- Non-whitewater-kayaking, rafting, canoeing
- No secondary contact recreation activities were observed
- Other secondary contact activities: \_\_\_\_\_

b. Check the number of individuals observed at the site.

- None  1-10  11-20  20-50  greater than 50

c. Check the following that apply regarding the individuals proximity to the water body.

- Secondary touch: fishing, pets and related contact with water  In a boat touching water
- Body on shore near water within 8 meters (25ft) of water  Body well away from water between 8 and 30 meters (100 ft)

2. If secondary contact recreation activities are not observed, describe the physical characteristics of the water body that may hinder the frequency of secondary contact (Attach photos, etc. for documentation).

\_\_\_\_\_

3. If secondary contact recreation activities are observed, how often do water recreational activities occur that do not involve a significant risk of water ingestion?  frequently  infrequently

Please describe how often the activities occur?  Unknown  Never  Daily  Monthly  Yearly

4. If infrequently, what is the reason?  physical characteristics of the water body  limited public access  other

If other, list reasons: \_\_\_\_\_

5. Describe the physical characteristics of the water body that hinders the frequency of secondary contact recreation (depth, etc.) (Attach photos or depth measurements, etc. for documentation).

\_\_\_\_\_

\_\_\_\_\_

6. Describe why there is limited public access (e.g. lack of roads, river or stream banks overgrown, etc.) (Attach photos, maps, etc. for documentation).

\_\_\_\_\_

\_\_\_\_\_

#### D. Noncontact Recreation Evaluation

*Noncontact recreation applies to water bodies where recreation activities do not involve a significant risk of water ingestion (e.g. activities with limited body contact incidental to shoreline activity, including birding, hiking, and biking), and where primary and secondary contact recreation uses do not occur because of unsafe conditions, such as barge traffic.*

1. Provide site-specific information and documentation (including photographs) regarding unsafe conditions, recreation activities, and presence or absence of water recreation activities.

\_\_\_\_\_

\_\_\_\_\_

### Field Data Sheets –RUAA Survey

Stream Name \_\_\_\_\_ Site: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_

#### E. Stream Channel and Substantial Pools Measurements

Please check the following which best describes the river or stream (A non-wadeable stream is one that is too deep to wade. Dry streams are considered wadeable.):  Wadeable  Non-wadeable

##### 1. Wadeable Streams

Determine whether or not the average depth at the thalweg is greater than 0.5 meters and if there are substantial pools with a depth of 1 meter or greater. Walk an approximately 300 meter reach (total) at the site and take the following measurements within the 300 meter reach. Measurements should be taken during dry weather flows (sustained or typical dry, warm-weather flows between rainfall events, excluding unusual antecedent conditions of drought or wet weather

Also, take photos facing upstream, downstream, left bank, and right bank at 0 meters, 150 meters, and 300 meters.

Photos #s (0 meters) Upstream \_\_\_\_\_ Downstream \_\_\_\_\_ Left Bank \_\_\_\_\_ Right Bank \_\_\_\_\_

Photos #s (150 meters) Upstream \_\_\_\_\_ Downstream \_\_\_\_\_ Left Bank \_\_\_\_\_ Right Bank \_\_\_\_\_

Photos #s (300 meters) Upstream \_\_\_\_\_ Downstream \_\_\_\_\_ Left Bank \_\_\_\_\_ Right Bank \_\_\_\_\_

a) Substantial pools - Measure the length of each pool within the 300 meter reach (if > 10 pools only measure 10 pools). Also measure the width (at the widest point) and deepest depth of each pool. A substantial pool is considered a pool greater than 10 meters in length for the purposes of a RUAA Survey. Report measurements to two significant figures. If depths are too deep to measure then report >1.5 meters.

	Length (meters)	Width (meters)	Depth (meters)
Pool 1			
Pool 2			
Pool 3			
Pool 4			
Pool 5			
Pool 6			
Pool 7			
Pool 8			
Pool 9			
Pool 10			

b) Average depth at the thalweg –Take depth measurements every 30 meters within the 300 meter reach to calculate an average depth at the thalweg (at least 11 measurements needed). Report measurements to two significant figures. If depths are too deep at a particular transect to measure then report >1.5 meters. Use 1.5 when calculating the mean.

Distance	Depth (meters)
0 meters	
30 meters	
60 meters	
90 meters	
120 meters	
150 meters	
180 meters	
210 meters	
240 meters	
270 meters	
300 meters	
Average	

**Field Data Sheets –RUAA Survey**

Stream Name \_\_\_\_\_ Site: \_\_\_\_\_  
 Date: \_\_\_\_\_ Time: \_\_\_\_\_

c) Stream width - Measure (1) the width at one point which represents the typical average width of the 300 meter reach; (2) the width at the narrowest point of the stream within the 300 meter reach; and (3) the width at the widest point of the stream within the 300 meter reach. Report measurements to two significant figures.

Measurement Type	Width (meters)
Typical Average Width of 300 meter reach	
Width at narrowest point of the stream within 300 meter reach	
Width at the widest point of the stream within 300 meter reach	

**2. Non-wadeable Stream:**

If accessible, take 11 width measurements which represent typical widths of the 300 meter reach. If the water is too deep the entire 300 meter reach then record the estimated average width of the water body. Report measurements to two significant figures.

Also, take photos facing upstream, downstream, left bank, and right bank at 0 meters, 150 meters, and 300 meters.

Photos #s (0 meters) Upstream \_\_\_\_\_ Downstream \_\_\_\_\_ Left Bank \_\_\_\_\_ Right Bank \_\_\_\_\_  
 Photos #s (150 meters) Upstream \_\_\_\_\_ Downstream \_\_\_\_\_ Left Bank \_\_\_\_\_ Right Bank \_\_\_\_\_  
 Photos #s (300 meters) Upstream \_\_\_\_\_ Downstream \_\_\_\_\_ Left Bank \_\_\_\_\_ Right Bank \_\_\_\_\_

# Measurements	Width (meters)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	

**Field Data Sheets –RUA Survey**

Stream Name \_\_\_\_\_ Site: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_

**F. Additional RUA Information. Summarize your observations for the entire 300 meter reach.**

**1. Check the following activities observed over the site reach.**

- Drinking or water in mouth
- Bathing
- Walking
- Jogging/running
- Bicycling
- Standing
- Sitting
- Lying down/sleeping
- Playing on shoreline
- Picnicking
- Motorcycle/ATV
- Hunting/Trapping
- Wildlife watching
- None
- Other: \_\_\_\_\_

2. Are there permanent or long-term hydrologic modifications that are constructed and operated in a way that affects the recreational uses?  Yes  No (If yes, please provide supporting documentation and photos.)

Comments: \_\_\_\_\_  
 \_\_\_\_\_

**3. Check any channel obstructions that apply (Attach photos).**

- Culverts
- Barbed wire
- Utility pipe
- Fences
- Dams
- Other (specify): \_\_\_\_\_
- Log jams
- Thick vegetation
- Rip rap
- Low bridges
- Water control structure
- None

**4. Check all surrounding conditions that promote recreational activities (Attach photos of evidence or unusual items of interest).**

- Campgrounds
- Playgrounds
- Rural area
- Residential
- National forests
- Urban/suburban location
- Golf Course
- Sports Field
- Stairs/walkway
- Boating access (ramps)
- Beach
- Bridge crossing
- Commercial boating
- Nearby school
- Paved parking lot
- Unimproved parking lot
- Roads (paved/unpaved)
- Populated area
- Docks or rafts
- Commercial outfitter
- Trails/paths (hiking/biking)
- Power Line Corridor
- Parks (national/city/county/state)
- Public Property
- Other: \_\_\_\_\_
- None of the Above

Comments: \_\_\_\_\_  
 \_\_\_\_\_

**5. Check all surrounding conditions that impede recreational activities (Attach photos of evidence or unusual items of interest).**

- Private Property
- No trespass sign
- Wildlife
- Steep slopes
- No public access
- No roads
- Fence
- Barge/ship traffic
- Industrial
- None of the Above
- Other: \_\_\_\_\_

Comments: \_\_\_\_\_  
 \_\_\_\_\_

**6. Check any indications of human use (Attach photos).**

- Roads
- Rope swings
- Dock/platform
- Foot paths/prints
- Other: \_\_\_\_\_
- RV/ATV Tracks
- Camping Sites
- Fire pit/ring
- Fishing Tackle
- NPDES Discharge
- Gates on corridor
- Children's toys
- Remnants of kids' play
- Organized event
- No Human Presence

Comments: \_\_\_\_\_  
 \_\_\_\_\_

**Field Data Sheets –RUA Survey**

Stream Name \_\_\_\_\_ Site: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_

7. Please list any additional items that may impede recreation, such as excessive aquatic vegetation or algae, excessive debris, garbage, snakes, alligators, abundant wildlife, etc.? (Attach photos).

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8. Please list any evidence of sustained aquatic habitat such as clam shells, aquatic or marsh vegetation, turtle shells, etc. (Attach photos)

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9. Is the site located in a wildlife preserve with large wildlife (i.e waterfowl) population?  Yes  No

10. Please document any other relevant information regarding recreational activities and the water body in general (for example, area outside of the stream reach evaluated).

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<u>Severity Value</u>	<u>Description</u>
<input type="checkbox"/> 1 No Flow	When a flow severity of 1 is recorded for a sampling visit, record a flow value of 0 ft/s (using parameter code 00061) for that sampling visit. A flow severity of 1 describes situations where the stream has water visible in isolated pools. There should be no obvious shallow subsurface flow in sand or gravel beds between isolated pools. "No flow" not only applies to streams with pools but also to long reaches of streams that have water from bank to bank but no detectable flow.
<input type="checkbox"/> 2 Low Flow	When streamflow is considered low, record a flow-severity value of 2 for the visit, along with the corresponding flow measurement (parameter code 00061). In streams too shallow for a flow measurement where water movement is detected, record a value of < 0.10 ft/s. <i>Note:</i> Use a stick or other light object to verify the direction of water movement. Make sure the movement is downstream and not the effect of wind. What is low for one stream could be high for another.
<input type="checkbox"/> 3 Normal Flow	When streamflow is considered normal, record a flow severity value of 3 for the visit, along with the corresponding flow measurement (parameter code 00061). "Normal" is highly dependent on the stream. Like low flow, what is normal for one could be high or low for another.
<input type="checkbox"/> 4 Flood Flow	Flow-severity values for high and flood flows have long been established by the EPA and are not sequential. Flood flow is reported as a flow severity of 4. Flood flows are those which leave the confines of the normal stream channel and move out onto the floodplain (either side of the stream).
<input type="checkbox"/> 5 High Flow	High flows are reported as a flow severity of 5. High flow would be characterized by flows that leave the normal stream channel but stay within the stream banks.
<input type="checkbox"/> 6 Dry	When the stream is dry, record a flow-severity value of 6 for the sampling visit. In this case the flow (parameter code 00061) is not reported. This will indicate that the stream is completely dry with no visible pools.

**Appendix C: Contact Information and RUAA Interview Forms**



### RUA Interview Form

Stream Name: \_\_\_\_\_ Segment #: \_\_\_\_\_ Site: \_\_\_\_\_

Interviewer's Name: \_\_\_\_\_

Date & Time (include AM or PM): \_\_\_\_\_

Interviewed:  In person  By phone  By mail  By e-mail

No interviews were conducted

If no interviews were conducted, please provide an explanation:

\_\_\_\_\_  
\_\_\_\_\_

\*Are you willing to respond to a short survey about this stream?  Yes  No

**Interviewee selected because** (e.g., resource manager, Gov. official, conservationist, property owner, local resident, standing by stream, etc.)

\_\_\_\_\_  
\_\_\_\_\_

#### **Questions:**

1. Are you familiar with this stream?  Yes  No If yes, how many years? \_\_\_\_\_  
If yes, proceed to #2. If no, stop here and do not conduct an interview.

2. What location(s) along the stream are you familiar with:

\_\_\_\_\_  
\_\_\_\_\_

3. Have the interviewer characterize the stream flow. Since the interviewer may not be familiar with TCEQ's definitions or distinction between the different water bodies, please refer to the definitions listed below when asking this question.

**Ephemeral:** A stream which flows only during or immediately after a rainfall event

**Intermittent:** A stream which has a period of zero flow for at least one week during most years. (Channel contains flowing water for only a portion of the year and surface water may be absent at times.)

**Intermittent w/ perennial pools:** An intermittent stream which maintains persistent pools even when flow in the stream is less than 0.1 cubic feet per second. (When not flowing, the water may remain in isolated pools.)

**Perennial:** A stream which flows continuously throughout the year.

4. Have you or your family personally used the stream for recreation?  Yes  No  
If yes, proceed to #6. If no, proceed to #5.

5(a). List reasons stream not used. \_\_\_\_\_  
\_\_\_\_\_

5(b). Proceed to #7.

### RUA Interview Form

Stream Name: \_\_\_\_\_ Segment #: \_\_\_\_\_ Site: \_\_\_\_\_

- 6.) a) How do you use the stream?  Swimming  Wading-Children  
 Water Skiing  Wind surfing  Tubing  Wading-Adults  
 Hunting  Kayaking  Rafting  Trapping  SCUBA diving  
 Snorkeling  Fishing  Boating  Canoeing  Skin Diving

b) When did these uses occur (e.g. year(s); season) and how often (times/year)?

\_\_\_\_\_

c) What location did these uses occur (get specific location and mark on a map)?

\_\_\_\_\_

7. Have you observed others using this stream for recreation?  Yes  No  
If yes, proceed to #8. If no, proceed to #9.

8. a) What kinds of uses have you witnessed?  Swimming  Wading-Children  
 Water Skiing  Wind surfing  Tubing  Wading-Adults  
 Hunting  Kayaking  Rafting  Trapping  SCUBA diving  
 Snorkeling  Fishing  Boating  Canoeing  Skin Diving

b) When did these uses occur (e.g. year(s); season) and how often (times/year)?

\_\_\_\_\_

c) What location did these uses occur (get specific location and mark on a map)?

\_\_\_\_\_

9. Have you heard about anyone using this stream for recreation?  Yes  No  
If yes, proceed to #10. If no, conclude the interview.

10. a) What kind of uses have you heard about?  Swimming  Wading-Children  
 Water Skiing  Wind surfing  Tubing  Wading-Adults  
 Hunting  Kayaking  Rafting  Trapping  SCUBA diving  
 Snorkeling  Fishing  Boating  Canoeing  Skin Diving

b) When did these uses occur (e.g. year(s); season) and how often (times/year)?

\_\_\_\_\_

c) What location did these uses occur (get specific location and mark on a map)?

\_\_\_\_\_

11. Can you recommend someone else we could contact that knows the stream?  Yes  No  
If yes, list person's contact information: \_\_\_\_\_

\_\_\_\_\_

12. Additional comments (from the interviewee or interviewer):

\_\_\_\_\_

\_\_\_\_\_

## **Appendix D: Corrective Action Report Form**

## Corrective Action Report

SOP-Q-105  
CAR #: 08-003

Report Initiation Date \_\_\_\_\_ Report By: \_\_\_\_\_ Procedure or QC Typ \_\_\_\_\_

Deviation: \_\_\_\_\_

Analyte: \_\_\_\_\_

Affected Sample #s: \_\_\_\_\_

Sampling Station: \_\_\_\_\_

Project(s): \_\_\_\_\_

**Attached  
Documentation:**

- COC
- FDS
- FlowLink
- Flow8
- GM
- Log Book
- QC Sheet
- Memo
- Other

Details of the problem, nonconformance or out-of-control situation:

\_\_\_\_\_  
\_\_\_\_\_

Possible Causes:

\_\_\_\_\_  
\_\_\_\_\_

Corrective Actions Taken:

\_\_\_\_\_  
\_\_\_\_\_

Corrective Actions Suggested:

\_\_\_\_\_  
\_\_\_\_\_

CAR routed to: \_\_\_\_\_ Date: \_\_\_\_\_

**Supervisor:**     Tier 1 (does not affect final data integrity)     Tier 2 (data accepted but flag required)     Tier 3 (possibly affects final data integrity)

Corrective actions taken for specific incident: \_\_\_\_\_

Corrective actions taken to prevent recurrences: \_\_\_\_\_

Corrective actions to be taken: \_\_\_\_\_

Responsible Party: \_\_\_\_\_ Proposed completion date: \_\_\_\_\_

Effect on data quality: \_\_\_\_\_

Responsible Supervisor: \_\_\_\_\_ Date: \_\_\_\_\_

**Concurrence:**

Program/Project Manager: \_\_\_\_\_ Date: \_\_\_\_\_  
(Tier 3 CARs only)

Quality Assurance Officer: \_\_\_\_\_ Date: \_\_\_\_\_