

**Texas State Soil and Water Conservation Board**  
**State Nonpoint Source Grant Program**  
**FY 2022 Workplan 22-53**

SUMMARY PAGE												
Title of Project	Brushy Creek Watershed Monitoring and Historical Streamflow Estimation											
Project Goals	<ul style="list-style-type: none"> <li>Supplement existing water quality and quantity data through water quality monitoring</li> <li>Estimate historical streamflow in ungauged portions of the watershed</li> </ul>											
Project Tasks	(1) Project Administration; (2) Quality Assurance; (3) Supplemental Water Quality and Continuous Streamflow Monitoring; (4) Data Summary Report and Historical Streamflow Estimation											
Measures of Success	<ul style="list-style-type: none"> <li>Collection and analysis of quality-assured surface water quality data</li> <li>Estimation of historical streamflow data in the ungauged portion of the watershed</li> </ul>											
Project Type	Implementation ( ); Education ( ); Planning (X); Assessment (X); Groundwater ( )											
Status of Waterbody on 2020 Texas Integrated Report	<table border="1"> <thead> <tr> <th>Segment ID</th> <th>Parameter of Impairment or Concern</th> <th>Category</th> </tr> </thead> <tbody> <tr> <td>1244_01</td> <td>Bacteria</td> <td>5c</td> </tr> <tr> <td>1244_03</td> <td>Bacteria</td> <td>5c</td> </tr> </tbody> </table>	Segment ID	Parameter of Impairment or Concern	Category	1244_01	Bacteria	5c	1244_03	Bacteria	5c		
Segment ID	Parameter of Impairment or Concern	Category										
1244_01	Bacteria	5c										
1244_03	Bacteria	5c										
Project Location (Statewide or Watershed and County)	Project Cities: Leander, Round Rock, Hutto, and Taylor Project Counties: Williamson and Milam											
Key Project Activities	Hire Staff ( ); Surface Water Quality Monitoring (X); Technical Assistance ( ); Education ( ); Implementation ( ); BMP Effectiveness Monitoring ( ); Demonstration ( ); Planning (X); Modeling ( ); Bacterial Source Tracking ( ); Other ( )											
2017 Texas NPS Management Program Reference	<ul style="list-style-type: none"> <li>Component 1: LTG 1, 2, 6, 7, 8</li> <li>Component 1: STG 1A, 1C, 3A, 3B, 3D, 3G</li> <li>Component 2, 3, 7</li> </ul>											
Project Costs	\$101,999											
Project Management	<ul style="list-style-type: none"> <li>Texas A&amp;M AgriLife Research, Texas Water Resources Institute</li> </ul>											
Project Period	June 28, 2022 – June 30, 2024											

**Part I – Applicant Information**

Applicant							
Project Lead		Dr. Lucas Gregory					
Title		Associate Director					
Organization		Texas A&M AgriLife Research, Texas Water Resources Institute					
E-mail Address		lucas.gregory@ag.tamu.edu					
Street Address		1001 Holleman Dr. E., 2118 TAMU					
City	College Station	County	Brazos	State	Texas	Zip Code	77840
Telephone Number	979-314-2361			Fax Number	N/A		

Project Partners	
Names	Roles & Responsibilities
Texas State Soil and Water Conservation Board (TSSWCB)	Provide state oversight and management of all project activities and ensure coordination of activities with related projects and the Texas Commission on Environmental Quality (TCEQ).
Texas A&M AgriLife Research, Texas Water Resources Institute (TWRI)	Provide project administration, coordination, and quality assurance, water quality monitoring and modeling.

**Part II – Project Information**

Project Type				
Surface Water	X	Groundwater		
Does the project implement recommendations made in (a) a completed WPP, (b) an adopted TMDL, (c) an approved I-Plan, (d) a Comprehensive Conservation and Management Plan developed under CWA §320, (e) the <i>Texas Coastal NPS Pollution Control Program</i> , or (f) the <i>Texas Groundwater Protection Strategy</i> ?				X
If yes, identify the document.		N/A		
If yes, identify the agency/group that developed and/or approved the document.		N/A		Year Developed N/A

Watershed Information				
Watershed or Aquifer Name(s)	Hydrologic Unit Code (12 Digit)	Segment ID	Category on 2020 IR	Size (Acres)
Brushy Creek	120702050401 - 120702050410	1244_01 1244_03	5c, CS, CN, NS	332,653

Water Quality Impairment		
Describe all known causes (i.e., pollutants of concern) and sources (e.g., agricultural, silvicultural) of water quality impairments or concerns from any of the following sources: <i>2020 Texas Integrated Report</i> , Clean Rivers Program Basin Summary/Highlights Reports, or other documented sources.		
<b>Impairments</b>		
<b>Segment ID 1244: Brushy Creek: From the confluence with the San Gabriel River in Milam County to the confluence of South Brushy Creek in Williamson County</b>		
<u>Parameter</u>	<u>Category</u>	<u>Year</u>
Bacteria	5c	2006
1244_01: From the confluence of the San Gabriel River upstream to the confluence of Mustang Creek		
1244_03: From the confluence of Cottonwood Creek upstream to the confluence of Lake Creek		
<b>Concerns</b>		
<b>SegID 1244: From the confluence with the San Gabriel River in Milam County to the confluence of South Brushy Creek in Williamson County</b>		
<u>Parameter</u>		<u>Level of Concern</u>
Bacteria		NS
1244_01: From the confluence of the San Gabriel River upstream to the confluence of Mustang Creek		
1244_03: From the confluence of Cottonwood Creek upstream to the confluence of Lake Creek		
<u>Parameter</u>		<u>Level of Concern</u>
Bacteria		CN

1244\_02: From the confluence of Mustang Creek upstream to the confluence of Cottonwood Creek

<u>Parameter</u>	<u>Level of Concern</u>
Nitrate	CS

1244\_01: From the confluence of the San Gabriel River upstream to the confluence of Mustang Creek

1244\_02: From the confluence of Mustang Creek upstream to the confluence of Cottonwood Creek

1244\_03: From the confluence of Cottonwood Creek upstream to the confluence of Lake Creek

<u>Parameter</u>	<u>Level of Concern</u>
Total Phosphorus	CS

1244\_03: From the confluence of Cottonwood Creek upstream to the confluence of Lake Creek

### Sources

**Segment ID 1244: From the confluence with the San Gabriel River in Milam County to the confluence of South Brushy Creek in Williamson County**

#### **Brushy Creek: Segment ID 1244, AU ID 1244\_01**

*E.coli, Nitrate*

Non-point sources: Unknown

#### **Brushy Creek: Segment ID 1244, AU ID 1244\_02**

*E.coli, Nitrate*

Point sources: Unknown

Non-point sources: Unknown

#### **Brushy Creek: Segment ID 1244, AU ID 1244\_03**

*E.coli, Nitrate, Total Phosphorus*

Point sources: Municipal point source discharges

Non-point sources: Unknown

### **2017 Brazos River Basin Summary Report**

Point Sources: Unknown

Non-point sources: Unknown

## Project Narrative

### Problem/Need Statement

Brushy Creek (Segment ID 1244) consists of four AUs, including 1244\_01, 1244\_02, 1244\_03, and 1244\_04. In the *2020 Texas Integrated Report*, AUs 1244\_01 and 1244\_03 are listed as impaired for elevated bacteria levels. In addition, AUs 1244\_01, 1244\_02, and 1244\_03 are listed for nitrate concerns. Moreover, there is a total phosphorus concern for AU 1244\_03.

Based on a *Recreational Use Attainability Analysis* conducted in the summer of 2010, primary contact recreation was determined to be the appropriate designation for Brushy Creek and the associated water quality standards have since been retained. To support future planning efforts in the Brushy Creek watershed, expanding water quality data collection efforts through supplemental monitoring activities is considered necessary. These efforts can help better characterize streamflow and water quality inhibitors and aid with the identification of potential causes and sources of pollution.

In addition to water quality data, instantaneous and continuous streamflow data are needed to help estimate historical flows for future watershed planning activities. All existing USGS gauges in the watershed are situated in the upstream urbanized portion of Brushy Creek, while the downstream rural portion of the watershed is ungauged. Thus, it is imperative to develop a validated method for estimating historical streamflow for the ungauged areas in the watershed. The continuous flow monitoring would be crucial for providing necessary input data.

## Project Narrative

### General Project Description

According to the *2017 Brazos River Basin Summary Report*, Brushy Creek flows through one of the fastest developing areas in Williamson County. Due to rapid population growth and drastic land use changes in the watershed, it has become increasingly relevant to assess the water quality issues in Brushy Creek.

In order to support a more comprehensive understanding of the waterbody's conditions, additional water quality data will be collected monthly for a total of 18 months at two monitoring sites in Brushy Creek. Existing water quality data will be retrieved and summarized along with the data acquired through the project to provide an evaluation of the water quality trends in Brushy Creek. Additionally, continuous flow data will be collected at one of the sites for the development of a streamflow estimation method that aims to generate historical streamflow at ungauged and/or poorly gauged areas. The chosen method is expected to support current watershed characterization efforts, including bacterial load analysis and load reduction analysis.



Tasks, Objectives and Schedules				
Task 1	Project Administration			
Costs	\$19,380			
Objective	To effectively administer, coordinate and monitor all work performed under this project including technical and financial supervision and preparation of status reports.			
Subtask 1.1	TWRI will prepare electronic quarterly progress reports (QPRs) for submission to the TSSWCB. QPRs shall document all activities performed within a quarter and shall be submitted by the 15 <sup>th</sup> of March, June, September, and December. QPRs shall be distributed to all Project Partners.			
	Start Date	Month 1	Completion Date	Month 24
Subtask 1.2	TWRI will perform accounting functions for project funds and will submit appropriate Reimbursement Forms to TSSWCB at least quarterly.			
	Start Date	Month 1	Completion Date	Month 24
Subtask 1.3	TWRI will host coordination meetings or conference calls, at least quarterly, with Project Partners to discuss project activities, project schedule, communication needs, deliverables, and other requirements. TWRI will develop lists of action items needed following each project coordination meeting and distribute them to project personnel.			
	Start Date	Month 1	Completion Date	Month 24
Subtask 1.4	TWRI will develop a Final Report that summarizes activities completed and conclusions reached during the project and discusses the extent to which project goals and measures of success have been achieved.			
	Start Date	Month 1	Completion Date	Month 24
Deliverables	<ul style="list-style-type: none"> <li>• QPRs in electronic format</li> <li>• Reimbursement Forms and necessary documentation in hard copy format</li> <li>• Final Report in electronic and hard copy formats</li> </ul>			

Tasks, Objectives and Schedules				
Task 2	Quality Assurance			
Costs	\$5,100			
Objective	To develop data quality objectives (DQOs) and quality assurance/control (QA/QC) activities to ensure data of known and acceptable quality are generated through this project.			
Subtask 2.1	TWRI will develop a QAPP for activities in Task 3 and Task 4 consistent with the most recent versions of <i>EPA Requirements for Quality Assurance Project Plans (QA/R-5)</i> and the <i>TSSWCB Environmental Data Quality Management Plan</i> . All monitoring procedures and methods prescribed in the QAPP shall be consistent with the guidelines detailed in the <i>TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue (RG-415)</i> and <i>Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data (RG-416)</i> . [Consistency with Title 30, Chapter 25 of the Texas Administrative Code, <i>Environmental Testing Laboratory Accreditation and Certification</i> , which describes Texas' approach to implementing the National Environmental Laboratory Accreditation Conference (NELAC) standards, shall be required where applicable.]			
	Start Date	Month 1	Completion Date	Month 3
Subtask 2.2	TWRI will implement the approved QAPP. TWRI will submit revisions and necessary amendments to the QAPP as needed.			
	Start Date	Month 3	Completion Date	Month 24
Deliverables	<ul style="list-style-type: none"> <li>• QAPP approved by TSSWCB in both electronic and hard copy formats</li> <li>• Approved revisions and amendments to the QAPP, as needed</li> <li>• Data of known and acceptable quality as reported through Task 3 and Task 4</li> </ul>			

Tasks, Objectives and Schedules			
Task 3	Supplemental Water Quality and Continuous Streamflow Monitoring		
Costs	\$69,359		
Objective	To collect surface water quality and continuous streamflow data for better understanding of the bacteria levels in Brushy Creek		
Subtask 3.1	TWRI will conduct monthly ambient water quality monitoring at two sites on Brushy Creek. Sampling will include routine field parameters (Temperature, pH, DO, conductivity) and collection of water samples of the volume required by the QAPP in Task 2. Instantaneous flow data will be collected at both sites monthly and additionally continuous flow data will be collected at one of the sites. Water samples will be delivered to Aqua-Tech Laboratories Inc. within the appropriate holding time for analysis. Water samples returned to the lab will be analyzed for <i>E. coli</i> bacteria.		
	Start Date	Month 3	Completion Date Month 21
Subtask 3.2	Aqua-Tech Laboratories Inc. will transfer completed lab analysis data to TWRI who will maintain a master database of collected data. Data will be submitted to TSSWCB by TWRI for submission to SWQMIS on a quarterly basis.		
	Start Date	Month 3	Completion Date Month 21
Subtask 3.3	Site Selection – TWRI will conduct sampling site reconnaissance at prospective sample sites identified to determine the suitability of sample collection. Once site selection has been finalized, those needing TCEQ station numbers will be submitted for a Station Location request (SLOC request).		
	Start Date	Month 1	Completion Date Month 2
Deliverables	<ul style="list-style-type: none"> <li>• Site Selection and SLOC requests (if needed)</li> <li>• Documentation of sampling events in QPRs</li> <li>• Quarterly data submissions (data summary and checklist, event and result files, and validator report) after successful upload into SWQMIS test environment</li> </ul>		

Tasks, Objectives and Schedules			
Task 4	Data Summary Report and Historical Streamflow Estimation		
Costs	\$8,160		
Objective	Summarize the water quality and flow data collected in Task 3 and estimate streamflow in the ungauged portion of the Brushy Creek watershed.		
Subtask 4.1	TWRI will aggregate existing water quality data in addition to the data collected in Task 3. The data will be visualized and analyzed using graphs, tables, etc. TWRI will also use the continuous flow data collected in Task 3 to develop a validated method for estimating historical streamflow data for ungauged or poorly gauged areas in the watershed.		
	Start Date	Month 16	Completion Date Month 24
Deliverables	<ul style="list-style-type: none"> <li>• Data Summary Report</li> <li>• Documentation describing the development of the streamflow estimation method.</li> </ul>		

Project Goals
<p>TWRI will acquire the surface water quality data currently available for the watershed. Existing data will be supplemented through monthly water quality monitoring at the sites identified from site recon and the QAPP. New data will be submitted to SWQMIS. Existing and supplemental data will be summarized in a final report to evaluate water quality trends.</p> <p>To aid future identification of the potential causes and sources of pollution, TWRI will monitor continuous streamflow data in the Brushy Creek watershed and use those flow data to develop and validate a streamflow estimation method.</p>



**Measures of Success**

This project will be considered successful upon collection of 18 months' worth of monthly ambient water quality data. Progress will be reported in quarterly progress reports and results will be provided in a final report. An additional measure of success would be the development of a validated streamflow estimation method for the ungauged portion of the watershed.

**2017 Texas NPS Management Program Reference**

**Components, Goals, and Objectives**

- Component 1: Explicit short- and long-term goals, objectives ... that protect surface and groundwater.
- LTG 1: Focus NPS abatement efforts, implementation strategies, and available resources in watersheds identified as impacted by nonpoint source pollution
  - LTG 2: Support the implementation of state, regional and local programs to prevent NPS pollution through assessment, implementation, and education
  - STG 1: Data Collection and Assessment: coordinate with appropriate federal, state, regional, and local entities.... Where additional information may be needed
  - Objective A: Identify surface water bodies ... that need additional information to characterize non-attainment of designated uses and water quality standards
  - Objective B: ensure that monitoring procedures meet quality assurance requirements .... or TSSWCB Quality Management Plans
- Component 2: Working partnerships and linkages with appropriate state, ... regional, and local entities, private sector groups and Federal agencies.
- Component 3: Balanced approach that emphasizes both statewide NPS programs and on-the-ground management of individual watersheds.
- Component 7: Manage and implement the NPS program efficiently and effectively, including necessary financial management

**Part III – Financial Information**

<b>Budget Summary</b>	
<b>Category</b>	<b>State</b>
Personnel	\$ 55,725
Fringe Benefits	\$ 20,555
Travel	\$ 2,131
Equipment	\$ 0
Supplies	\$ 60
Contractual	\$ 0
Construction	\$ 0
Other	\$ 10,224
Total Direct Costs	\$ 88,695
Indirect Costs (≤ 15%)	\$ 13,304
Unrecovered IDC	
Total Project Costs	\$ 101,999

<b>Budget Justification</b>		
<b>Category</b>	<b>Total Amount</b>	<b>Justification</b>
Personnel	\$ 55,725	Associate Director: \$101,261 annually, 0.42 mo. (1.72% per year) – \$3,642 Program Manager: \$71,467 annually, 2 mo. (8.33% per year) – \$12,448 TBD Quality Assurance Officer: \$75,000 annually, 0.84 mo. (3.5% per year) – \$5,295 Research Specialist: \$44,000 annually, 6.76 mo. (28.15% per year) – \$25,916 TBD Research Assistant: \$45,000 annually, 2.21 mo. (9.21% per year) – \$8,424 *named positions are budgeted with a 3% annual pay increase in all years; TBD positions and graduate students are budgeted with a 3% pay increase in years after year 1 *(Salary estimates are based on average monthly percent effort for the entire contract. Actual percent effort may vary more or less than estimated between months; but in aggregate, will not exceed total effort estimates for the entire project.) *cell phone allowances for project calls/emails during & after business hours & travel are occasionally factored into salaries & fringe, but again, will not exceed overall dollar amount.
Fringe Benefits	\$ 20,555	Fringe for faculty and staff is calculated at 18.8% salary plus \$825 per month. *Fringe benefits estimates are based on salary estimates listed. Actual fringe benefits will vary between months coinciding with percent effort variations; but in aggregate, will not exceed the overall estimated total.
Travel	\$ 2,131	Mileage for water quality monitoring estimated at 18 trips, up to 225 miles round trip per sampling event @ state rate per mile for state vehicles
Equipment	\$ 0	N/A
Supplies	\$ 60	General project supplies, including, but not limited to: pens, paper, binders, labels, etc.
Contractual*	\$ 0	N/A
Construction	\$ 0	N/A
Other	\$ 10,224	Sampling Equipment Rental for 18 months: \$ 7,560 Doppler Flow Meter = \$360 Lab Analysis: \$1,944 Water Quality Database Maintenance: \$360
Indirect	\$ 13,304	Per the RFP requirements, indirect costs are limited at 15% of total direct costs. \$88,695 Total Direct Costs * 15% = \$13,304