



**Texas State Soil and Water Conservation Board  
 State Nonpoint Source Grant Program  
 FY 2018 Workplan 18-52**

SUMMARY PAGE			
Title of Project	Characterizing the Middle Yegua, Davidson Creek, and Deer Creek Watersheds		
Project Goals	<ul style="list-style-type: none"> <li>Evaluate Existing Data to Characterize Causes and Sources of Pollution</li> <li>Supplement existing water quality data through sample collection</li> <li>Develop/maintain a successful public education campaign and stakeholder group.</li> </ul>		
Project Tasks	(1) Project Administration; (2) Quality Assurance; (3) Public Outreach, Education, and Involvement; (4) Data Acquisition and Evaluation of Existing Data for Pollutant Characterization and Source Identification; and (5) Supplemental Monitoring for WPP Development		
Measures of Success	<ul style="list-style-type: none"> <li>Delivery of education programs and public involvement</li> <li>Collection and analysis of existing data</li> <li>Collection and analysis of quality assured data generated for watershed sampling sites</li> <li>Estimated source loadings and needed reductions</li> </ul>		
Project Type	Implementation ( ); Education (X); Planning (X); Assessment (X); Groundwater ( )		
Status of Waterbody on 2014 Texas Integrated Report	<u>Segment ID</u> 1211A 1212A 1242J_01	<u>Parameter of Impairment or Concern</u> Bacteria, depressed dissolved oxygen Bacteria, depressed dissolved oxygen, impaired habitat Bacteria; impaired microbenthic community, <i>E.coli</i>	<u>Category</u> 5b, CS 5b, CS, CS 5C, CN, NS
Project Location (Statewide or Watershed and County)	Davidson Creek Watershed in Milam and Burleson Counties Middle Yegua Creek Watershed in Lee, Bastrop, Williamson, and Milam counties Deer Creek Watershed in Falls County		
Key Project Activities	Hire Staff ( ); Surface Water Quality Monitoring (X); Technical Assistance ( ); Education (X); Implementation ( ); BMP Effectiveness Monitoring ( ); Demonstration ( ); Planning (X); Modeling ( ); Bacterial Source Tracking ( ); Other ( )		
2012 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, 1B, 1C, 3A, 3B, 3D, 3G</li> <li>Component 2, 3, 8</li> </ul>		
Project Costs	\$284,154		
Project Management	<ul style="list-style-type: none"> <li>Texas A&amp;M AgriLife Research, Texas Water Resources Institute</li> </ul>		
Project Period	April 1, 2018 – March 31, 2020		

## Part I – Applicant Information

Applicant							
Project Lead		T. Allen Berthold, Ph.D.					
Title		Senior Research Scientist					
Organization		Texas A&M AgriLife Research, Texas Water Resources Institute					
E-mail Address		<a href="mailto:taberthold@ag.tamu.edu">taberthold@ag.tamu.edu</a>					
Street Address		578 John Kimbrough Blvd, Suite 130					
City	College Station	County	Brazos	State	TX	Zip Code	77843
Telephone Number		979-845-2028			Fax Number		979-845-0662

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 TCEQ.
Texas A&M AgriLife Research, Texas Water Resources Institute (TWRI)	Provide project oversight, QA/QC, public education and outreach, public meeting facilitation, conduct data collection, water sample collection, analysis, and characterization.
Watershed stakeholder including, but not limited to, landowners, soil and water conservation districts, city officials, county officials, river authorities, not for profit organizations, and other federal, state, and local governments	Work with TWRI to gain and provide needed information for the characterization of these watersheds.

## 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 2014 IR	Size (Acres)
Davidson Creek Watershed	120701020401 - 120701020406	1211A	5b	140,082
Middle Yegua Creek Watershed	120701020101 - 120701020111	1212A	5b, CS, CN	282,957
Deer Creek Watershed	120701010111 120701010110 120701010109	1242J	5c	73,789

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>2014 Texas Integrated Report</i> , Clean Rivers Program Basin Summary/Highlights Reports, or other documented sources.			
<b>IMPAIRMENTS</b>			
<b>Segment 1211A: Davidson Creek</b>			
<i>1211A_02</i>	<u>Impairment</u> bacteria depressed dissolved oxygen	<u>Category</u> 5b 5c	<u>Year Listed</u> 2002 2010
<b>Segment 1212A: Middle Yegua Creek</b>			
<i>1212A_02</i>	<u>Impairment</u> bacteria	<u>Category</u> 5b	<u>Year Listed</u> 2010
<b>Segment 1242J: Deer Creek</b>			
<i>1242J_01</i>	<u>Impairment</u> bacteria	<u>Category</u> 5b	<u>Year Listed</u> 2006
<b>CONCERNS</b>			
<b>Segment 1211A: Davidson Creek</b>			
		<u>Impairment</u>	<u>Category</u>

1212A_02	depressed dissolved oxygen	CS
<b>Segment 1212A:</b> Middle Yegua Creek		
	<u>Impairment</u>	<u>Category</u>
1212A_02	depressed dissolved oxygen	CS
	impaired habitat	CS
<b>Segment 1211A:</b> Davidson Creek		
	<u>Impairment</u>	<u>Category</u>
1242J_01	Impaired microbenthic community	CN

## Project Narrative

### Problem/Need Statement

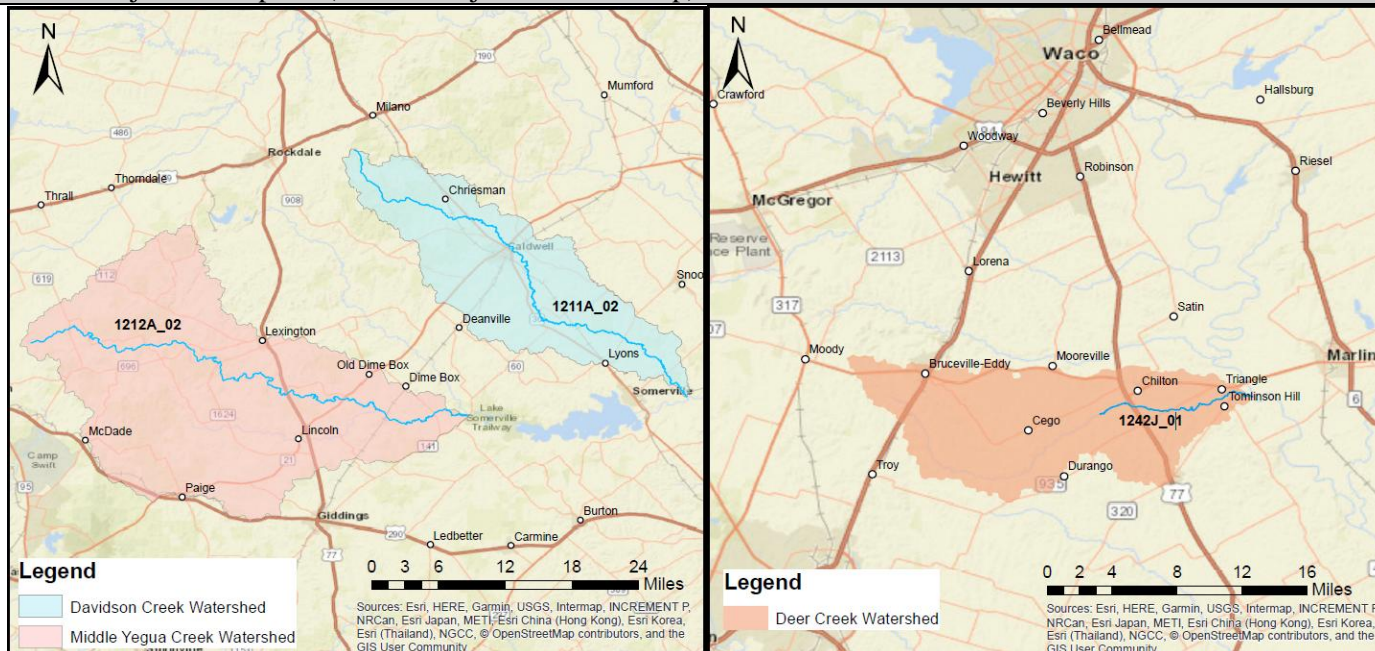
Water quality in Davidson Creek, Middle Yegua Creek, and Deer Creek currently exceeds recreational use standards and as a result, a Recreational Use Attainability Analysis was conducted on each. Reports show that primary contact recreation occurs on all waterbodies (<https://www.tceq.texas.gov/waterquality/standards/ruaas/ruaasbrazos>) indicating that standards will not change.

To more accurately assess the waterbodies and identify potential causes and sources of pollution, water quality monitoring and characterization are needed. It is through monitoring and adequate data that watershed managers will be able to get a true assessment of water quality and water quality inhibitors. To identify potential causes and sources that degrade water quality, existing data should first be collected and analyzed through a watershed characterization process. This process helps explain to interested parties why there is a need for watershed planning and implementation activities. Local data and information is needed from stakeholders in the area; therefore, stakeholders should be engaged through the characterization process.

To ensure that stakeholders all have the same understanding of the project goals and objectives, an education program should be delivered where stakeholders can learn and understand what contributes to water quality impairments and ways that they can be mitigated. This process is the first step in actually engaging stakeholders in developing a strategy and ensures that management strategies can be developed and supported from the local level.

## Project Narrative

### General Project Description (Include Project Location Map)



Through this project, existing data such as water quality data, flow, wildlife and livestock estimates, number of septic systems, etc. will be collected and evaluated to assist in identifying causes and sources of parameters impairing water quality. This characterization will be conducted using Geographic Information Systems analysis, National Agricultural Statistics Service, Council of Governments data as well as a variety of other sources. To supplement existing data and attempt to fill data gaps and improve analysis, additional water quality and flow data will be collected at 8 sites monthly (2 sites in the Deer Creek watershed and 3 sites in each of the Middle Yegua Creek and Davidson Creek watersheds). Such data is crucial in estimating load reductions. Load reductions needed to accomplish water quality standards and goals will be calculated using Load Duration Curves.

Stakeholders will be educated through a variety of programs that focus on impairment parameters, local water quality, and what can be done to improve water quality. In addition to these education programs, stakeholders will be engaged, when appropriate, to participate in characterizing the watershed and estimating pollutant loading reductions.

Tasks, Objectives and Schedules				
Task 1	Project Administration			
Costs	\$18,747			
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 1st 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 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 20	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	\$5,356			
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 4 and 5 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 6
Subtask 2.2	TWRI will implement the approved QAPP. TWRI will submit revisions and necessary amendments to the QAPP as needed.			
	Start Date	Month 6	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 QAPP, as needed</li> <li>• Data of known and acceptable quality as reported through Task 4 and 5</li> </ul>			

<b>Tasks, Objectives and Schedules</b>			
Task 3	Public Outreach, Education, and Involvement		
Costs	\$45,529		
Objective	To educate, identify, engage, and gain stakeholder support for the characterization of Davidson Creek, Middle Yegua Creek and Deer Creek watersheds		
Subtask 3.1	Public Education – TWRI will host public education and outreach events in each project area as instructors are available but will consist of no less than one annually per watershed. Hosting these events requires providing coordination and logistical support even though the program itself is already supported through other sources of funding. Such events can include, but should not be limited to, the following programs: <ul style="list-style-type: none"> <li>• Lone Star Healthy Streams;</li> <li>• Texas Well Owner Network;</li> <li>• Texas Watershed Stewards;</li> <li>• Texas Riparian and Stream Ecosystem Education</li> </ul>		
	Start Date	Month 1	Completion Date Month 24
Subtask 3.2	Coordination of Stakeholder Group Activities –TWRI will identify and meet with key stakeholders in the watershed to inform them of water quality issues and solicit their input regarding sample site locations.		
	Start Date	Month 1	Completion Date Month 24
Subtask 3.3	Dissemination of Project Information – TWRI will conduct public outreach to inform the public about upcoming meetings and educational events, locations of educational materials, status of ongoing project, current water quality and how the public/stakeholders can address water quality issues. Activities may include but are not limited to: <ul style="list-style-type: none"> <li>• Hosting a project webpage (updated quarterly);</li> <li>• Direct mailings (one to select stakeholders);</li> <li>• Public events (project information and presentations at events) as appropriate</li> </ul>		
	Start Date	Month 1	Completion Date Month 24
Deliverables	<ul style="list-style-type: none"> <li>• Host public education and outreach event agendas, sign-in sheets, and other available documents (one annually)</li> <li>• Stakeholder Group and Public meeting agendas, minutes, sign-in sheets, and other available documentation (as necessary)</li> <li>• Disseminated project information through:               <ul style="list-style-type: none"> <li>• Project website (updated quarterly)</li> <li>• Direct mailings (one to select stakeholders)</li> </ul> </li> </ul>		

<b>Tasks, Objectives and Schedules</b>			
Task 4	Data Acquisition and Evaluation of Existing Data for Pollutant Characterization and Source Identification		
Costs	\$112,483		
Objective	To collect data and information to identify causes and sources of water quality impairments, issues in the watershed, and estimate loading reductions needed to meet water quality standards.		
Subtask 4.1	<p>Assemble Existing Data and Information – TWRI will gather existing data and information pertaining to water quality impairments and issues in the watershed. This will consist of any data which can be used to:</p> <ul style="list-style-type: none"> <li>• Support the GIS analysis;</li> <li>• Calculate LDCs;</li> <li>• Describe relevant watershed characteristics;</li> <li>• Identify causes and sources of water quality impairments and issues; and,</li> <li>• Estimate pollutant loadings (or potential loadings) from these sources if available data exists to support estimation methods. At minimum, loading will be estimated for point sources and nonpoint sources.</li> </ul> <p>This data and information will be assembled into an inventory of watershed, water quality, and water quality management data and information for the watersheds.</p>		
	Start Date	Month 1	Completion Date Month 24
Subtask 4.2	<p>Analyze Existing Data and Information – TWRI will perform GIS analysis throughout the project area and estimate pollutant loadings from sources contributing to water quality impairments and concerns. This will be completed by analyzing existing data and information and, to the extent possible, characterizing water quality conditions, watershed conditions, and sources of pollution contributing to water quality impairments and issues. The analysis will:</p> <ul style="list-style-type: none"> <li>• Lead to an understanding of where and when water quality impairments and/or issues occur and what could be causing the impairments and issues; and,</li> <li>• Be the basis for the selection of the analytical method (Load Duration Curves and GIS analysis or equivalent) that will be used to estimate pollutant loadings from sources in the watershed that contribute to water quality impairments and issues identified in Subtask 4.1.</li> </ul> <p>The data and information will be presented in appropriate formats including graphs, tables, and maps.</p>		
	Start Date	Month 1	Completion Date Month 18
Subtask 4.3	<p>Estimate Pollutant Loading Reductions – Using loading data from causes and sources collected in subtask 4.1 and analysis in subtask 4.2, estimated pollutant loading reductions needed to meet water quality standards and other goals will be calculated, using Load Duration Curves or equivalent. Analysis will achieve EPA Element B.</p>		
	Start Date	Month 1	Completion Date Month 18
Deliverables	<ul style="list-style-type: none"> <li>• Watershed Inventory</li> <li>• Documentation of GIS System Analysis</li> <li>• Documentation of LDC analysis</li> </ul>		



<b>Tasks, Objectives and Schedules</b>			
Task 5	Water Quality Monitoring for Watershed Characterization		
Costs	\$102,039		
Objective	To collect surface water quality and flow data to supplement LDC analysis and better characterize impairing parameters within the watershed		
Subtask 5.1	Site Selection – TWRI will conduct sampling site reconnaissance at prospective sample sites identified to determine the suitability of sample collection that will best help characterize the watershed(s). 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
Subtask 5.2	Water Quality Monitoring – TWRI will conduct routine, monthly, ambient water quality monitoring at two sites in the Deer Creek watershed and three sites in each of the Middle Yegua Creek and Davidson Creek watersheds. Sampling will include routine field parameters (Temperature, pH, DO, conductivity, flow) and collection of water samples of the volume required by the QAPP in Task 2. Water samples will be delivered to the Texas A&M Soil and Aquatic Microbiology Laboratory (SAML) within the appropriate holding time for analysis.		
	Start Date	Month 1	Completion Date
Subtask 5.3	Water Quality Data Submission – SAML 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 1	Completion Date
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>• SWQMIS data submissions (Data sets, Data Review Checklists)</li> </ul>		

### **Project Goals (Expand from Summary Page)**

TWRI will work to evaluate existing data within the project area in an effort to characterize causes and sources of pollution. Data will be supplemented through monthly water quality monitoring at sites identified through the characterization process. TWRI will also calculate loadings and loading reductions needed to meet water quality standards. To gain public support of the project, TWRI will facilitate a stakeholder group (if determined to be appropriate) and identify objectives and goals needed for the watershed planning process. This will also include hosting a public education events where stakeholders will be educated on water quality and mitigation strategies.

### **Measures of Success (Expand from Summary Page)**

Overall, this project will be successful when stakeholders have contributed to a consensus decision of goals, objectives, and indicators for addressing the water quality issues in the watersheds. Through stakeholder involvement and public meetings, outlined in the tasks above, goals, objectives, and indicators will be tracked across meetings for consistency and overlap and presented to full stakeholder groups for a consensus decision. Further, this project will be successful when the watersheds have been characterized through data collection efforts and loadings and loading reductions have been calculated. Progress will be reported in quarterly progress reports and results will be provided in a final report.

**2012 Texas NPS Management Program Reference (Expand from Summary Page)**

**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.
  - LTG 6: Increase overall public awareness of NPS issues and prevention activities
  - LTG 8: Enhance public participation and outreach by providing forums for citizens and industry to contribute their ideas and concerns about the water quality management process
  - 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
    - Objective E: Conduct monitoring to determine effectiveness of TMDL I-Plans, WPPs, and BMP implementation
  - STG 3: Education: Conduct education and technology transfer activities to help increase awareness of NPS pollution and prevent activities contributing to the degradation of water bodies, including aquifers, by NPS pollution
    - Objective A: Enhance existing outreach programs at the state, regional and local levels to maximize the effectiveness of NPS education
    - Objective B: Administer programs to educate citizens about water quality and their potential role in causing NPS pollution
    - Objective D: Conduct outreach through the ...Texas Cooperative Extension, Soil and Water Conservation Districts, and others to facilitate broader participation and partnerships. Enable stakeholders and the public to participate in decision-making and provide a more complete understanding of water quality issues and how they relate to each citizen.
- Objective G: Implement public outreach and education to maintain and restore water quality in water bodies impacted by NPS pollution.
- Component 2: Working partnerships and linkages to appropriate state, ..., regional and local entities, private sector groups and Federal agencies.
- Component 3: Balanced approach that emphasizes both state-wide nonpoint source programs and on-the-ground management of individual watersheds.
- Component 8: Manage and implement the NPS program efficiently and effectively, including necessary financial management

### Part III – Financial Information

<b>Budget Summary</b>	
Personnel	\$ 162,545
Fringe Benefits	\$ 46,820
Travel	\$ 4,600
Equipment	\$ 0
Supplies	\$ 600
Contractual	\$ 0
Construction	\$ 0
Other	\$ 32,525
Total Direct Costs	\$ 247,090
Indirect Costs ( $\leq 15\%$ )	\$ 37,064
Total Project Costs	\$ 284,154

Budget Justification		
Category	Total Amount	Justification
Personnel	\$ 162,545	Senior Research Scientist – \$66,093 @ 2 months = \$11,512 Senior Research Scientist & QAO – \$82,256 @ 2 months = \$14,326 Research Associate - \$48,000 @ 12 months = \$50,182 Program Manager - \$76,778 @ 2 months = \$12,937 Research Assistant - \$45,000 @ 6 months = 22,838 Graduate Student - \$50,000 @ 12 months = 50,750 *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 the 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	\$ 46,820	Salaried Employee Fringe Benefits Calculated at: 0.168 * salary + \$746/mo. Graduate Student Fringe Benefits Calculated at: 0.1 * salary + \$422/mo.  *(Fringe benefits estimates are based on salary estimates listed. Actual fringe benefits will vary between months coinciding with percent effort variations; but in the aggregate, will not exceed the overall estimated total.) *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.
Travel	\$ 4,600	Monitoring Mileage – 400 miles *\$0.50 per mile *20 trips = \$4,000 Watershed Mileage (education programs, etc – 100 miles * \$0.50 per mile * 12 trips = \$600
Equipment	\$ 0	N/A
Supplies	\$ 600	General office supplies
Contractual*	\$ 0	N/A
Construction	\$ 0	N/A
Other	\$ 32,525	Laptop - \$3,000 Sampling Equipment Rental - \$10,125 Facility Rental - \$1,000 Lab Analysis - \$14,400 (8 sites * \$100 per sample * 18 monitoring events) Communication Services - \$4,000
Indirect	\$ 37,064	15% of total direct costs \$247,090 * 15% = 37,064