



**Texas State Soil and Water Conservation Board  
 Clean Water Act §319(h) Nonpoint Source Grant Program  
 FY2012 Workplan 12-10**

SUMMARY PAGE						
Title of Project	Bacterial Source Tracking to Support Adaptive Management of the Arroyo Colorado Watershed Protection Plan					
Project Goals	<ul style="list-style-type: none"> <li>Evaluate bacterial concentrations and sources in the Arroyo Colorado watershed</li> </ul>					
Project Tasks	(1) Project Administration; (2) Quality Assurance; (3) Surface Water Quality Monitoring; (4) Source Survey and Known Source Collection; and (5) Bacterial Source Tracking					
Measures of Success	<ul style="list-style-type: none"> <li>Detailed assessment of bacterial levels throughout the Arroyo Colorado watershed</li> <li>Identification of major bacterial sources</li> </ul>					
Project Type	Implementation ( ); Education ( ); Planning ( ); Assessment (X); Groundwater ( )					
Status of Waterbody on 2010 Texas Integrated Report	<u>Segment ID</u>	<u>Parameter</u>			<u>Category</u>	
	2201 (Arroyo Colorado Tidal)	bacteria			5c	
	2202 (Arroyo Colorado Above Tidal)	dissolved oxygen			5a	
Project Location (Statewide or Watershed and County)	Arroyo Colorado Watershed located within Hidalgo, Cameron and Willacy Counties					
Key Project Activities	Hire Staff ( ); Surface Water Quality Monitoring (X); Technical Assistance ( ); Education ( ); Implementation ( ); BMP Effectiveness Monitoring ( ); Demonstration ( ); Planning ( ); Modeling ( ); Bacteria Source Tracking (X); Other ( )					
Texas NPS Management Program Elements	<ul style="list-style-type: none"> <li>Element 1 LTGs 1, 2, 5</li> <li>Element 1 STGs 1B, 1C, 2A</li> <li>Element 2, 3</li> </ul>					
Project Costs	Federal	\$465,555	Non-Federal	\$167,343	Total	\$632,898
Project Management	<ul style="list-style-type: none"> <li>Texas Water Resources Institute</li> </ul>					
Project Period	November 1, 2012 – January 31, 2016					

## Part I – Applicant Information

Applicant							
Project Lead	Dr. Kevin Wagner						
Title	Associate Director						
Organization	Texas Water Resources Institute						
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Co-Applicant							
Project Lead	Dr. Jude Benavides						
Title	Assistant Professor						
Organization	University of Texas Rio Grande Valley – Dept. of Chemistry and Environmental Sciences						
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Co-Applicant							
Project Lead	Dr. George D. Di Giovanni						
Title	Professor, Environmental and Occupational Health Sciences						
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Telephone Number	915-747-8509			Fax Number	915-747-8512		

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 Water Resources Institute (TWRI)	Project coordination, administration, and reporting (Task 1), QAPP development (Task 2), source survey & known source sample collection (Task 4). Also, through funding from TCEQ, staff of TWRI serves as the Arroyo Colorado Watershed Coordinator.
University of Texas, School of Public Health (UTSPH)	Bacterial source tracking (Task 5)
University of Texas Rio Grande Valley (UTRGV)	Surface water quality monitoring (Task 3)
Brownsville Public Utilities Board Analytical Laboratory	Conduct sample preparation for BST analysis and enumeration

## 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, or (d) a Comprehensive Conservation and Management Plan developed under CWA §320?				Yes	X	No	
If yes, identify the document.		<i>A Watershed Protection Plan for the Arroyo Colorado Phase I</i>					
If yes, identify the agency/group that developed and/or approved the document.		Arroyo Colorado Watershed Partnership in conjunction with the Texas Sea Grant and TCEQ		Year Developed	2007		

Watershed Information				
Watershed Name(s)	Hydrologic Unit Code (12 Digit)	Segment ID	305(b) Category	Size (Acres)
Arroyo Colorado Watershed	121102080100 121102080300 121102080600 121102080700 121102080800 121102080900	2201/2202	5c	418,144

**Water Quality Impairment**

Describe all known causes (pollutants of concern) of water quality impairments or concerns from any of the following sources: *2010 Texas Integrated Report*, Clean Rivers Program Basin Summary/Highlights Reports or other documented sources.

**IMPAIRMENTS (*2010 Texas Integrated Report*)**

**Segment 2201: Arroyo Colorado Tidal**

	<u>Impairment</u>	<u>Category</u>	<u>Year Listed</u>
2203_03	bacteria	5c	2006
2201_04	bacteria	5c	2006
2201_05	depressed dissolved oxygen	5a	1996
	bacteria	5c	2006
	depressed dissolved oxygen	5a	1996

**Segment 2201B:**

	<u>Impairment</u>	<u>Category</u>	<u>Year Listed</u>
2201B_01	bacteria	5c	2010

**Segment 2202: Arroyo Colorado Above Tidal**

2202_01	bacteria	5b	1996
2202_02	bacteria	5b	1996
2202_03	bacteria	5b	1996
2202_04	bacteria	5b	1996

**Segment 2202B:**

	<u>Impairment</u>	<u>Category</u>	<u>Year Listed</u>
2202B_01	bacteria	5c	2010

**CONCERNS (*2010 Texas Integrated Report*)**

**Segment 2201: Arroyo Colorado Tidal**

	<u>Impairment</u>	<u>Category</u>
2201_01	Chlorophyll- <i>a</i>	CS
	nitrate	CS
2201_02	Chlorophyll- <i>a</i>	CS
	nitrate	CS
2201_03	Chlorophyll- <i>a</i>	CS
	nitrate	CS
	orthophosphorus	CS
2201_04	Chlorophyll- <i>a</i>	CS
	nitrate	CS
	orthophosphorus	CS
2201_05	ammonia	CS
	Chlorophyll- <i>a</i>	CS
	depressed dissolved oxygen	CN
	nitrate	CS

	orthophosphorus	CS
<b>Segment 2201A</b>		
	<u>Impairment</u>	<u>Category</u>
2201A_01	ammonia	CS
2201B_01	chlorophyll-a	CS
	nitrate	CS
<b>Segment 2202</b>		
	<u>Impairment</u>	<u>Category</u>
2202_01	ammonia	CS
	chlorophyll-a	CS
	nitrate	CS
	orthophosphorus	CS
	total phosphorus	CS
2202_02	chlorophyll-a	CS
	nitrate	CS
	orthophosphorus	CS
	total phosphorus	CS
2202_03	ammonia	CS
	chlorophyll-a	CS
	nitrate	CS
	orthophosphorus	CS
	total phosphorus	CS
2202_04	ammonia	CS
	chlorophyll-a	CS
	nitrate	CS
	orthophosphorus	CS
	total phosphorus	CS
<b>Segment 2202B</b>		
	<u>Impairment</u>	<u>Category</u>
2202B_01	chlorophyll-a	CS
	ammonia	CS
	bacteria	CN
<b>Segment 2202C</b>		
	<u>Impairment</u>	<u>Category</u>
2202C_01	ammonia	CS
	bacteria	CN

## Project Narrative

### Problem/Need Statement

The Arroyo Colorado Watershed is located in the Lower Rio Grande Valley of South Texas and flows through the middle of Hidalgo and Cameron counties. The lower 16 miles of the Arroyo Colorado is the boundary between Cameron and Willacy counties. The Arroyo Colorado drainage area is a subwatershed of the Nueces-Rio Grande Coastal Basin, also known as the Lower Laguna Madre Watershed. The streams of the Nueces-Rio Grande Coastal Basin, including the Arroyo Colorado, drain to the Laguna Madre, which is considered to be one of the most productive hypersaline lagoon systems in the world. The Lower Rio Grande Valley comprises the northern part of the Rio Grande Delta, a broad fluviodeltaic plain laid down over tens of thousands of years by the ancestral Rio Grande. Just as the Rio Grande is the major source of freshwater for the Lower Rio Grande Valley, the Arroyo Colorado serves as the main drainage stream for this area of Texas.

The Arroyo Colorado currently has low dissolved oxygen levels within the tidal segment, not meeting the aquatic life use designated by the State of Texas and described in the Water Quality Standards. This has been the case for every 303(d) list prepared by the state since 1996. In addition, bacteria has always been a parameter of concern and as of 2006, the Arroyo became impaired due to high bacteria levels. There are many challenges associated with restoring water quality in the Arroyo Colorado Watershed. The watershed is one of the most productive agricultural areas in the State; however, it also has one of the fastest growing populations of any region in the state as well, which increases the threat for bacterial impairments.

Surface water irrigation on consumptive crops is widely used. This bacteria impairment not only poses a human health threat through contact recreation but also potentially through consuming food that is grown with this water.

Previous work conducted in this area has laid the ground work and produced outcomes that will be incorporated into this effort. Specifically, the TSSWCB funded project (06-10) entitled *Arroyo Colorado Agricultural Nonpoint Source Assessment* utilized the SWAT model to simulate flow and nutrient loadings to the Arroyo Colorado. These data provide critical flow and nutrient information that will aid in the development of BMPs to address bacteria and nutrient loadings and develop estimated load reductions that will be incorporated into the revision of the Arroyo Colorado Watershed Protection Plan (WPP). Additionally, other efforts are ongoing with a range of focus from sustaining the partnership to educating landowners on available financial incentive programs to implement agricultural BMPs.

TCEQ is funding a project to revise the Arroyo Colorado WPP. Initially written with implementation scheduled through 2015, the Arroyo Colorado WPP focused primarily on nutrients, but through adaptive management, the bacteria impairment has become an issue stakeholders are prepared to address in the next phase of the plan.

Although data collected through these projects tend to justify the currently listed impairment, this data remains limited and additional data is needed to accurately calculate bacteria loading rates and the most likely sources of bacterial contamination. The needs for a bolstered data set and comprehensive data analysis arise as management options are considered. Without adequate data, uncertainty increases in properly identifying the sources of contamination in the watershed while comprehensive data analysis is needed to hone in on potential sources of water pollutants. Collecting 12 months of additional water quality and streamflow data along with input from local stakeholders will provide much needed information that will enable more accurate watershed pollutant source assessments and the revision of a focused and effective Arroyo Colorado WPP.

**Project Narrative**

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

Through this project, a water quality monitoring regime will be employed that will help decision makers make appropriate recommendations for addressing the bacteria impairment in the revision of the Arroyo Colorado WPP. Monthly sampling will be conducted at 10 sampling sites as identified in the WPP. UTRGV will conduct water sampling, measure field parameters (pH, temperature, conductivity, and dissolved oxygen), and deliver samples to the NELAP-accredited Brownsville Public Utilities Board Analytical Laboratory for enumeration of *E. coli* and *Enterococcus*. Data will be stored in a database maintained by UTRGV containing field and lab analysis data. UTRGV will manage and prepare data consistent with the TCEQ Data Management Reference Guide (DMRG) for submittal to TSSWCB (through TWRI) and subsequent transmittal to TCEQ for inclusion in Surface Water Quality Monitoring Information System (SWQMIS).

Station ID	Description
13086	Arroyo Colorado at FM 336 South of McAllen
13084	Arroyo Colorado at US 281 South of Pharr
13082	Arroyo Colorado at FM 493 South of Donna
13080	Arroyo Colorado at FM 506 South of La Feria
13079	Arroyo Colorado at U.S. 77 in Southwest Harlingen
13074	Arroyo Colorado at Low Water Bridge at Port Harlingen
13072	Arroyo Colorado Tidal FM 106 Bridge at Rio Hondo
13073	Arroyo Colorado Tidal at Camp Perry North of Rio Hondo
13559	Arroyo Colorado Tidal at Marker 27 (Mile 15) 0.5 Mile North of the Point Where Channel Becomes Boundary Between Willacy and Cameron Counties
13782	Arroyo Colorado Tidal Near CM 16 at Arroyo City, KM 10.9



TWRI will conduct a source survey to identify possible sources of bacteria in the watershed. Based on this assessment, TWRI, in consultation with UTSPH, will collect 200 known source fecal samples and ship them to UTSPH according to established protocols for processing and inclusion in the Texas *E. coli* BST Library. Further, Brownsville PUB Analytical Laboratory will prepare water samples for transport to UTSPH for BST analysis. To assess and identify different sources contributing to bacterial loadings, UTSPH will conduct library-dependent BST and analyze *E. coli* isolates using the ERIC-PCR and

\*10 of the 12 sites shown in the figure above will be monitored as listed in the previous table

RiboPrinting combination method. Results of the source survey, assessment of bacterial levels at each site, and BST results will be presented to the Arroyo Colorado Watershed Partnership (ACWP) for incorporation into the WPP.

Tasks, Objectives and Schedules						
Task 1	Project Administration					
Costs	Federal	\$18,622	Non-Federal	\$6,694	Total	\$25,316
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 January, April, July and October. QPRs shall be distributed to all Project Partners.					
	Start Date	Month 3		Completion Date	Month 39	
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 3		Completion Date	Month 39	
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 39	
Subtask 1.4	TWRI will include project-related content on the existing Arroyo Colorado Watershed Partnership ( <a href="http://arroyocolorado.org/">http://arroyocolorado.org/</a> ) website.					
	Start Date	Month 1		Completion Date	Month 39	
Subtask 1.5	TWRI, UTSPH, and UTRGV will present findings of this project to the Arroyo Colorado Watershed Partnership, Steering Committee, Work Groups, and other relevant stakeholder groups.					
	Start Date	Month 20		Completion Date	Month 36	
Subtask 1.6	TWRI, with assistance from UTSPH and UTRGV, will develop a final report and other materials as appropriate to disseminate project results. The Final Report shall, at a minimum, summarize water quality data collected through this project and characterize trends and variability in collected water quality monitoring data.					
	Start Date	Month 20		Completion Date	Month 39	
Deliverables	<ul style="list-style-type: none"> <li>• Quarterly progress reports in electronic format</li> <li>• Reimbursement Forms and necessary documentation in hard copy format</li> <li>• List of action items from project coordination meetings</li> <li>• Project related content on existing website</li> <li>• Final Report in electronic and hard copy formats</li> </ul>					

Tasks, Objectives and Schedules						
Task 2	Quality Assurance					
Costs	Federal	\$13,967	Non-Federal	\$5,020	Total	\$18,987
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 coordinate with all project partners to develop a QAPP for activities in Tasks 3, 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 Program (NELAP) standards, shall be required.					
	Start Date	Month 1		Completion Date	Month 19	
Subtask 2.2	TWRI will implement the approved QAPP. TWRI will submit revisions and necessary amendments to the QAPP as needed.					
	Start Date	Month 20		Completion Date	Month 39	
Deliverables	<ul style="list-style-type: none"> <li>QAPP approved by TSSWCB and EPA 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 Tasks 3-5</li> </ul>					

Tasks, Objectives and Schedules						
Task 3	Surface Water Quality Monitoring					
Costs	Federal	\$65,178	Non-Federal	\$23,428	Total	\$88,606
Objective	To collect surface water quality data and characterize bacterial concentrations and loadings throughout the Arroyo Colorado watershed.					
Subtask 3.1	<p>UTRGV will conduct routine ambient monitoring at 10 locations as identified in the ACWPP (watershed-scale monitoring stations) monthly, collecting field and bacteria parameter groups. The QAPP, as detailed in Task 2, will precisely identify sites. The sampling period extends over 12 months. Total number of samples scheduled for collection through this subtask is 120 <i>E. coli</i> and 120 <i>Enterococcus</i> samples.</p> <p>UTRGV will deliver water samples to Brownsville PUB Analytical Laboratory for <i>E. coli</i> and <i>Enterococcus</i> enumeration. <i>E. coli</i> will be prepared using the EPA 1603 method also to be utilized for BST. <i>Enterococcus</i> will be enumerated only, using the IDEXX method.</p> <p>Field parameters are pH, temperature, conductivity, and dissolved oxygen. Flow parameters are flow collected by gage, electrical, mechanical or Doppler, including severity.</p>					
	Start Date	Month 20		Completion Date	Month 32	
	Subtask 3.2	<p>Brownsville PUB Analytical Laboratory will store Method 1603 modified mTEC plates, from subtask 3.1, at 4°C for shipment to UTSPH. Brownsville PUB Analytical Laboratory will coordinate the shipment of these samples with UTSPH such that they are received in El Paso within 3 days following enumeration.</p>				
	Start Date	Month 20		Completion Date	Month 32	
Subtask 3.3	<p>UTRGV will maintain a master database for housing all environmental water quality data collected through the project. UTRGV will maintain a database of field parameters data collected under the project and transmit this data for TWRI for inclusion into the master database. TWRI will transfer monitoring from activities in Task 3 to TSSWCB for inclusion in the TCEQ SWQMIS at least quarterly. Data will be transferred in the correct format using the TCEQ file structure along with a completed Data Summary, as described in the most recent version of the TCEQ Surface Water Quality Monitoring Data Management Reference Guide. TWRI will post data from monitoring activities collected in Task 3 to the project website quarterly. TWRI will submit Station Location Request to TCEQ as needed, to obtain TCEQ station numbers for new monitoring sites. Data Correction Request Forms will be submitted to TSSWCB whenever errors are discovered in data already reported. TWRI will work with the Clean Rivers Program Partners to input the monitoring regime, as detailed in the QAPP, into the TCEQ CMS.</p>					
	Start Date	Month 20		Completion Date	Month 33	
Deliverables	<ul style="list-style-type: none"> <li>• Station Location Request (as needed) in electronic format</li> <li>• Monitoring data files and Data Summary in electronic format</li> <li>• Data Correction Request Forms (as needed) in electronic format</li> <li>• Monitoring data updates posted to the project website</li> <li>• Data results and interpretation included in the Final Report</li> </ul>					

Tasks, Objectives and Schedules						
Task 4	Source Survey and Known Source Collection					
Costs	Federal	\$46,556	Non-Federal	\$16,734	Total	\$63,290
Objective	To identify possible sources of bacteria loadings in the watershed by conducting a source survey. To collect needed known source fecal samples from the study area to augment the Known Source BST Library.					
Subtask 4.1	<p>TWRI will collaborate with UTSPH to facilitate a meeting of local stakeholders and technical experts to design a source survey that characterizes the possible sources of bacteria loadings in the study area. The source survey should be developed so that it represents warm and cool seasons and low and high flow conditions. The source survey should evaluate sources like WWTFs, central sewage collection systems, OSSFs, <i>colonias</i>, and MS4s. TPDES compliance issues should be examined. Wildlife, livestock and non-domestic animal populations should be examined.</p> <p>Technical experts should include at least one representative, as appropriate to their jurisdiction and interest, from Texas Parks and Wildlife Department, Texas Department of Agriculture, Texas Commission on Environmental Quality, Texas A&amp;M AgriLife Extension Service, Nueces River Authority, International Boundary and Water Commission U.S. Section, USDA APHIS Texas Wildlife Services, U.S. Geological Survey, U.S. Fish and Wildlife Service, USDA Natural Resources Conservation Service, USDA Agricultural Research Service, and affected municipalities, counties, irrigation and drainage districts, and SWCDs.</p> <p>TWRI will conduct the source survey as designed. Results from the source survey will be used by UTSPH to assess the adequacy of the Texas Known Source BST Library and to guide the collection of known source fecal samples (subtask 4.2).</p>					
	Start Date	Month 20		Completion Date	Month 27	
	Subtask 4.2	<p>The Texas Known Source BST Library needs to be supplemented with known source fecal samples from the study area. TWRI will work with others to collect 200 known source fecal samples from the study area. Fecal samples will be stored at 4°C and shipped to UTSPH for <i>E. coli</i> isolation and analysis. TWRI will coordinate the shipment of these samples with UTSPH such that they are received in El Paso within 3 days of collection. Sources of fecal samples will be selected in coordination with UTSPH and outlined in subtask 4.1.</p>				
	Start Date	Month 20		Completion Date	Month 27	
Deliverables	<ul style="list-style-type: none"> <li>• Results from Source Survey described in Final Report</li> <li>• Collection of known source fecal samples for the Texas <i>E. coli</i> BST Library</li> </ul>					

Tasks, Objectives and Schedules						
Task 5	Bacterial Source Tracking					
Costs	Federal	\$321,232	Non-Federal	\$115,466	Total	\$436,699
Objective	To conduct Bacterial Source Tracking to assess and identify different sources contributing to bacteria loadings in the Arroyo Colorado watershed.					
Subtask 5.1	UTSPH will supplement the Texas <i>E. coli</i> BST Library with the 200 known source fecal samples collected as outlined in subtask 4.2. Isolates will be added to the BST Library utilizing the ERIC-PCR and RiboPrinting combination method. Isolates will be screened using ERIC-PCR and the non-clonal isolates will be further analyzed using RiboPrinting. An estimated 600 fecal isolates (3 per fecal sample) will be screened using ERIC-PCR and an estimated non-clonal 300 fecal isolates will be analyzed using RiboPrinting.					
	Start Date	Month 20		Completion Date	Month 31	
Subtask 5.2	UTSPH will conduct library-dependent BST and analyze 720 <i>E. coli</i> isolates from the 144 water samples (5 isolates per water sample) collected and prepared (Task 3.1) by UTRGV and Brownsville PUB Analytical Laboratory respectively. The ERIC-PCR and RiboPrinting combination method will be used.					
	Start Date	Month 20		Completion Date	Month 31	
Subtask 5.3	UTSPH will analyze data to assess different sources contributing to bacterial loading in the Arroyo Colorado watershed. UTSPH will provide data analysis results for inclusion in the final report and will present as needed to the Arroyo Colorado Watershed Partnership.					
	Start Date	Month 32		Completion Date	Month 36	
Deliverables	<ul style="list-style-type: none"> <li>• Analysis of BST results for presentation to ACWP and inclusion in the Final Report</li> <li>• Known source fecal isolates added to the Texas <i>E. coli</i> BST Library</li> </ul>					

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

The goal of the project is to characterize the bacterial concentrations, loadings, and sources in the Arroyo Colorado watershed so that appropriate measures for improving water quality can be determined and included in the revised WPP in order to improve water quality.

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

This project will be successful when:

- quality data has been collected and analyzed for the different watershed sampling sites and BST analysis for the various contributing sources have been identified,
- recommendations have been made for addressing the bacteria impairment which will be included in the revision of the Arroyo Colorado WPP.

### **2005 Texas Nonpoint Source Management Program Reference (Expand from Summary Page)**

Element One – Explicit short – and long-term goals, objectives and strategies that protect surface and groundwater

#### LTG Objectives

- 1 – Focus NPS abatement efforts, implementation strategies, and available resources in watersheds identified as impacted by nonpoint source pollution
- 2 – Support the implementation of state, regional, and local programs to prevent nonpoint source pollution through assessment, implementation, and education
- 5 – Develop partnerships, relationships, memoranda of agreement, and other instruments to facilitate collective, cooperative approaches to manage NPS pollution

#### Short-term Goals

Goal One – Data Collection and Assessment: Coordinate with appropriate federal, state, regional, and local entities, private sector groups, and citizen groups and target CWA §319(h) grant funds towards water quality assessment activities in high priority, nonpoint source-impacted watersheds, vulnerable and impacted aquifers, or areas where additional information is needed.

- Objective B – Ensure that monitoring procedures meet quality assurance requirements and are in compliance with EPA-approved TCEQ and/or TSSWCB Quality Management plans
- Objective C – Conduct Special studies to determine sources of NPS pollution and gain information to target TMDL activities and BMP implementation

Goal Two – Implementation: Coordinate and administer the NPS program to support the implementation of TMDL Implementation Plans and/or WPPs and other state, regional, and local plans/programs to reduce NPS pollution. Manage all CWA §319(h) grant funds efficiently and effectively to target implementation activities to the areas identified as impacted, or degraded with respect to use by NPS pollution.

- Objective A – Work with regional and local entities to determine priority areas and develop and implement strategies to address NPS pollution in those areas

Element Two – Working partnerships and linkages to appropriate state, interstate, tribal, regional, and local entities, private sector groups, and Federal agencies

Element Three – Balanced approach that emphasizes both state-wide nonpoint source programs and on-the-ground management of individual watersheds

**Part III – Financial Information**

<b>Budget Summary</b>				
Federal	\$	465,555	% of total project	73.6%
Non-Federal	\$	167,343	% of total project (≥ 40%)	26.4
Total	\$	632,898	Total	100%
Category		Federal	Non-Federal	Total
Personnel	\$	46,634	\$ 10,710	\$ 57,344
Fringe Benefits	\$	15,536	\$ 2,177	\$ 17,713
Travel	\$	6,204	\$ 0	\$ 6,204
Equipment	\$	0	\$ 0	\$ 0
Supplies	\$	453	\$ 0	\$ 453
Contractual	\$	356,003	\$ 105,518	\$ 461,521
Construction	\$	0	\$ 0	\$ 0
Other	\$	20,094	\$ 0	\$ 20,094
Total Direct Costs	\$	444,744	\$ 118,405	\$ 563,149
Indirect Costs (≤ 15%)	\$	20,811	\$ 48,938	\$ 69,749
Total Project Costs	\$	465,555	\$ 167,343	\$ 632,898

The TSSWCB CWA §319(h) NPS Grant Program has a 60/40% match requirement. The cooperating entity will be reimbursed 60% from federal funds and must contribute a minimum of 40% of the total costs to conduct the project. The 40% match must be from non-federal sources and should be described in the budget justification. Reimbursable indirect costs are limited to no more than 15% of total federal direct costs. The project budget generally covers a three year period.

<b>Budget Justification (Federal)</b>		
Category	Total Amount	Justification
Personnel	\$ 46,634	<ul style="list-style-type: none"> <li>• TWRI Project Manager - (.07 FTE) - \$4,050</li> <li>• TWRI Quality Assurance Officer (.04 FTE) - \$4,699</li> <li>• TWRI Web Developer (.04 FTE) - \$4,030</li> <li>• IRNR Research Scientist - (.11 FTE) – \$13,368</li> <li>• TWRI Extension Assistant (.2 FTE) - \$20,487</li> </ul>
Fringe Benefits	\$ 15,536	<ul style="list-style-type: none"> <li>• TWRI Project Manager - (.07 FTE) - \$1,319</li> <li>• TWRI Quality Assurance Officer (.04 FTE) - \$1,400</li> <li>• TWRI Web Developer (.04 FTE) - \$1,159</li> <li>• IRNR Research Scientist - (.11 FTE) – 3,883</li> <li>• TWRI Extension Assistant (.2 FTE) - \$7,775</li> </ul> <p>(Calculated at 17.7% of Personnel to cover FICA, UCI, WCI, and retirement. Additional \$591/mo. prorated per %FTE is calculated for group health insurance)</p>
Travel	\$ 6,023	<ul style="list-style-type: none"> <li>• TWRI Project Manager (\$1,180 per trip with 2 trips) or (600 per flight + \$84 per night (3 nights) + \$46 per diem (4 days) + \$36 per day rental car – total \$2,360</li> <li>• IRNR Travel (350 mi per trip at \$.555 + \$46 per diem (5 days) + \$84 (4 nights) for 4 trips) – total \$3,663</li> </ul>
Equipment	\$ 0	N/A
Supplies	\$ 453	<ul style="list-style-type: none"> <li>• TWRI Office Supplies (Ex. Box of Paper, Mailing Labels, Flash Drive, Pens, Pen Refills, etc.) – total \$453</li> </ul>
Contractual	\$ 356,003	<ul style="list-style-type: none"> <li>• UTRGV-Environmental Department (\$40,062)</li> <li>• UTSPH - El Paso (\$315,941)</li> </ul>
Construction	\$ 0	N/A
Other	\$ 20,094	<ul style="list-style-type: none"> <li>• Brownsville PUB Analytical Laboratory (EPA 1603 for E. coli) 10 sites * 12 months = 120 samples @ \$50 per sample = \$6,000</li> <li>• Brownsville PUB Analytical Laboratory (IDEXX for E. coli) 10 sites * 12 months = 120 samples @ \$50 per sample = \$6,000</li> <li>• Brownsville PUB Analytical Laboratory (IDEXX for Enterococci) 10 sites * 12 months = 120 samples @ \$50 per sample = \$6,000</li> <li>• Sample Shipping - \$50 per shipment (12 samples for 1603 + 28 known source sample shipments = 60 @ \$50 per shipment) = \$2,000</li> <li>• Brownsville PUB Analytical Laboratory Lab Filter (1) = \$94</li> </ul>
Indirect	\$ 20,811	15% of Modified Total Direct Federal Costs (Total minus Contractual >\$25,000 per contract and Equipment) (per U.S. Dept. HHS approved TAMUS Agreement with negotiated rate 46%)

<b>Budget Justification (Non-Federal)</b>		
Category	Total Amount	Justification
Personnel	\$ 10,710	<ul style="list-style-type: none"> <li>• TWRI Director (.03 FTE) - \$10,710</li> </ul>
Fringe Benefits	\$ 2,177	<ul style="list-style-type: none"> <li>• TWRI Director (.03 FTE) - \$2,177</li> </ul>
Travel	\$ 0	N/A
Equipment	\$ 0	N/A
Supplies	\$ 0	N/A
Contractual	\$ 105,518	<ul style="list-style-type: none"> <li>• UTRGV-Environmental Department (\$15,643)</li> <li>• UTSPH - El Paso (\$89,875)</li> </ul>
Construction	\$ 0	N/A
Other	\$ 0	N/A
Indirect	\$ 48,938	<ul style="list-style-type: none"> <li>• 46% of Modified Total Direct Non-Federal Costs: \$5,928</li> <li>• 31% of Modified Total Direct Federal Costs: \$43,010 (Unrecovered IDC)</li> </ul>

<b>Contractual Budget Justification (Federal) – UTSPH</b>		
Category	Total Amount	Justification
Personnel	\$ 166,882	<ul style="list-style-type: none"> <li>• (DiGiovanni) (.08 FTE for year 1; .1 FTE for year 2; .1 FTE for year 3, only 11 months) - \$35,541</li> <li>• (Casarez) (.6 FTE for 2 years) - \$55,216</li> <li>• (Truesdale) (1 FTE for 2 years) - \$76,125</li> </ul>
Fringe Benefits	\$ 51,949	<ul style="list-style-type: none"> <li>• (DiGiovanni) (.08 FTE for year 1; .1 FTE for year 2; .1 FTE for year 3, only 11 months) - \$8,531</li> <li>• (Casarez) (.6 FTE for 2 years) - \$16,013</li> <li>• (Truesdale) (1 FTE for 2 years) - \$27,405</li> </ul>
Travel	\$ 500	<ul style="list-style-type: none"> <li>• Travel to 1 Stakeholder Meeting - flight round trip approx. \$304 + \$84 per night (1 night) + \$56 per diem (2 days) – total \$500</li> </ul>
Equipment	\$ 0	N/A
Supplies	\$ 55,400	<ul style="list-style-type: none"> <li>• Fecal sample E. coli isolations: 200 @ \$25 = \$5,000</li> <li>• E. coli isolation from water samples (10 sites x 12 mo = 120 x 5 isolates/sample ) 600 isolates @ \$8 = \$4,800</li> <li>• ERIC-PCR supplies: [600 fecal isolates (3 per fecal sample) &amp; 600 water isolates] 1,200 isolates @ \$8 = \$9,600</li> <li>• RiboPrinting supplies: (600 water &amp; 300 fecal isolates) 900 isolates @ \$40 = \$36,000</li> </ul>
Contractual	\$ 0	N/A
Construction	\$ 0	N/A
Other	\$ 0	N/A
Indirect	\$ 41,210	<ul style="list-style-type: none"> <li>• 15% of Direct Costs</li> </ul>

<b>Contractual Budget Justification (Non-Federal) – UTSPH</b>		
Category	Total Amount	Justification
Personnel	\$ 38,181	• (DiGiovanni) (.1 FTE for year 1; .1 FTE for year 2; .1 FTE for year 3, only 11 months) - \$38,181
Fringe Benefits	\$ 9,164	• (DiGiovanni) (.1 FTE for year 1; .1 FTE for year 2; .1 FTE for year 3, only 11 months) - \$9,164
Travel	\$ 0	N/A
Equipment	\$ 0	N/A
Supplies	\$ 0	N/A
Contractual	\$ 0	N/A
Construction	\$ 0	N/A
Other	\$ 0	N/A
Indirect	\$ 42,530	Unrecovered 11% of Total Direct Federal Costs \$30,221 Non Federal Indirect Costs (26%) \$12,310

<b>Contractual Budget Justification (Federal) – UTRGV</b>		
Category	Total Amount	Justification
Personnel	\$ 27,329	• Jude A. Benavides (4 Weeks in year 1 and 2; 2 weeks in year 3) - \$21,569 • Two Student workers (20 hrs/wk for 10 weeks @ \$9/hr for year 1) - \$3,600 • Two Student workers (20 hrs/wk for 6wks @ 9\$/hr) - \$2,160
Fringe Benefits	\$ 4,243	• Associate Professor – Calculated at 17% of Personnel - \$3,667 • Student Workers – Calculated at 10% of Personnel - \$576
Travel	\$ 1,665	Approximately 250 miles to travel to 10 sites monthly and deliver samples to Brownsville Analytical Laboratory at \$0.555 per mile.
Equipment	\$ 0	N/A
Supplies	\$ 1,600	• Sampling and Office Supplies (Ex. Box of Paper, Mailing Labels, Flash Drive, Pens, Pen Refills, Bottles, Rope, Ice Chest etc.) (\$800 Annually for years 1 & 2)
Contractual	\$ 0	N/A
Construction	\$ 0	N/A
Other	\$ 0	N/A
Indirect	\$ 5,225	15% of total direct

<b>Contractual Budget Justification (Non-Federal) – UTRGV</b>		
Category	Total Amount	Justification
Personnel	\$ 4,314	Associate Professor @ 2 weeks in yr 1
Fringe Benefits	\$ 733	Associate Professor – Calculated at 17% of Personnel
Travel	\$ 0	N/A
Equipment	\$ 0	N/A
Supplies	\$ 0	N/A
Contractual	\$ 0	N/A
Construction	\$ 0	N/A
Other	\$ 0	N/A
Indirect	\$ 10,596	Unrecovered IDC - 50% of Salaries (Federal) minus 15% Federal Indirect Cost - \$8,439 Nonfederal IDC – 50% Salaries - \$2,157