

Granbury Watershed Protection Plan  
Quality Assurance Project Plan

Brazos River Authority  
Waco, TX 76710

Funding Source:

Nonpoint Source Program CWA §319(h)  
Prepared in cooperation with the Texas Commission on Environmental Quality  
and the U.S. Environmental Protection Agency  
Federal ID # \_C9-99614616

Effective Period: One year from date of final approval

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

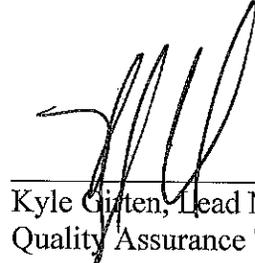
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**A1 Approval Page**

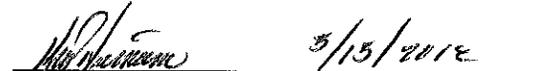
**TEXAS COMMISSION ON ENVIRONMENTAL QUALITY**

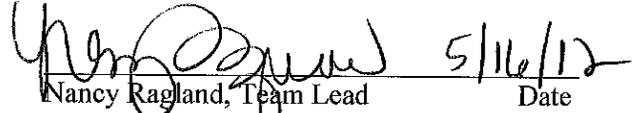
**Field Operations Support Division**

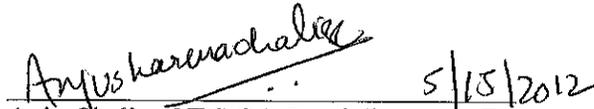
  
Stephen Stubbs, TCEQ QA Manager Date 5.17.12

  
Kyle Giffen, Lead NPS QA Specialist Date 5/16/12  
Quality Assurance Team

**Water Quality Planning Division**

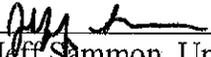
  
Kerry Niemann, Team Leader Date 5/15/2012  
Nonpoint Source Program

  
Nancy Ragland, Team Lead Date 5/16/12  
Data Management and Analysis

  
Anju Chalise, NPS QA Specialist Date 5/15/2012  
Nonpoint Source Program

  
Arthur Talley, NPS Project Manager Date 5/14/2012  
Project Manager, Nonpoint Source Program

**Brazos River Authority**

 May 11, 2012  
Jeff Sammon, Upper Basin Planner Date

 10 May 12  
Kay Barnes, QA Officer Date

The Brazos River Authority will secure written documentation from additional project participants (e.g., subcontractors, laboratories) stating the organization's awareness of and commitment to requirements contained in this quality assurance project plan and any amendments or revisions of this plan. The Brazos River Authority will maintain this documentation as part of the project's quality assurance records. This documentation will be available for review. Copies of this documentation will also be submitted as deliverables to the TCEQ NPS Project Manager within 30 days of final TCEQ approval of the QAPP. (See sample letter in Attachment 1 of this document.)

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### **A3 Distribution List**

The Lead NPS QA Specialist will provide original versions of this project plan and any amendments or revisions of this plan to the TCEQ NPS Project Manager and the BRA Project Manager. The TCEQ NPS Project Manager will provide copies to the TCEQ Data Management and Analysis Team Leader and EPA Project Officer within two weeks of approval. The TCEQ NPS Project Manager will document receipt of the plan and maintain this documentation as part of the project's quality assurance records. This documentation will be available for review.

Nancy Ragland, Team Leader  
Data Management and Analysis  
MC-234  
(512) 239-6546

### **U.S. Environmental Protection Agency Region 6**

#### **State/Tribal Section**

**1445 Ross Avenue**

**Suite # 1200**

**Dallas, TX 75202-2733**

Leslie Rauscher, Project Officer

(214) 665-2773

The BRA will provide copies of this project plan and any amendments or revisions of this plan to each project participant defined in the list below. The BRA will document receipt of the plan by each participant and maintain this documentation as part of the project's quality assurance records. This documentation will be available for review.

### **Brazos River Authority**

**4600 Cobbs Dr., Waco, TX 76710**

Jeff Sammon, Project Manager

(254)-761-3132

Kay Barnes, Quality Assurance Officer

(254)-761-3131

**List of Acronyms**

AWRL	Ambient Water Reporting Limit
BMP	Best Management Practice
BRA	Brazos River Authority
CAP	Corrective Action Plan
CMS	Coordinated Monitoring System
COC	Chain of Custody
CRP	Clean Rivers Program
CWA	Clean Water Act
DOC	Demonstration of Capability
DMP	Data Management Plan
DMRG	Data Management Reference Guide
DM&A	Data Management and Analysis
DQO	Data Quality Objective
DQAO	Deputy Quality Assurance Officer
E & C Manager	Environmental and Compliance Manager
EPA	Environmental Protection Agency
GIS	Geographic Information System
GPS	Global Positioning System
IBWC	International Boundary Water Commission
IT	Information Technology
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LIMS	Laboratory Information Management System
LGWPPSG	Lake Granbury Watershed Protection Plan Stakeholder Group
LOD	Limit of Detection
LOQ	Limit of Quantitation
MS	Matrix Spike
NELAC	National Environmental Laboratory Accreditation Conference
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source

PO	Project Officer
QA/QC	Quality Assurance/Quality Control
QAM	Quality Assurance Manual
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QAS	Quality Assurance Specialist
QMP	Quality Management Plan
RPD	Relative Percent Difference
SLOC	Station Location
SOP	Standard Operating Procedure
SRF	State Revolving Fund
SWQM	Surface Water Quality Monitoring
SWQMIS	Surface Water Quality Monitoring Information System
TCEQ	Texas Commission on Environmental Quality
TSWQS	Texas Surface Water Quality Standards
TWDB	Texas Water Development Board
WPP	Watershed Protection Plan
WQI	Water Quality Inventory
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
WWTP	Waste Water Treatment Plant

## **A4 Project/Task Organization**

### **TCEQ**

#### **Field Operations Support Division**

##### **Kyle Girten**

##### **Lead NPS QA Specialist**

Assists the TCEQ Project Manager in QA related issues. Serves on planning team for NPS projects. Participates in the planning, development, approval, implementation, and maintenance of the QAPP. Determines conformance with program quality system requirements. Coordinates or performs audits, as deemed necessary and using a wide variety of assessment guidelines and tools. Concurs with proposed corrective actions and verifications. Monitors corrective action. Provides technical expertise and/or consultation on quality services. Provides a point of contact at the TCEQ to resolve QA issues. Recommends to TCEQ management that work be stopped in order to safe guard project and programmatic objectives, worker safety, public health, or environmental protection.

#### **Water Quality Planning Division**

##### **Kerry Niemann, Team Leader**

##### **NPS Program**

Responsible for management and oversight of the TCEQ NPS Program. Oversees the development of QA guidance for the NPS program to be sure it is within pertinent frameworks of the TCEQ. Monitors the effectiveness of the program quality system. Reviews and approves all NPS projects, internal QA audits, corrective actions, reports, work plans, and contracts. Enforces corrective action, as required. Ensures NPS personnel are fully trained and adequately staffed.

##### **Arthur Talley**

##### **TCEQ NPS Project Manager**

Maintains a thorough knowledge of work activities, commitments, deliverables, and time frames associated with projects. Develops lines of communication and working relationships between the contractor, the TCEQ, and the EPA. 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. Serves on planning team for NPS projects. Participates in the development, approval, implementation, and maintenance of the QAPP. Assists the TCEQ QAS in technical review of the QAPP. Responsible for verifying that the QAPP is followed by the contractor. Notifies the TCEQ QAS of particular circumstances which may adversely affect the quality of data derived from the collection and analysis of samples. Enforces corrective action.

**Anju Chalise**

**NPS Quality Assurance Specialist**

Assists Lead QAS with NPS QA management. Serves as liaison between NPS management and Agency QA management. Responsible for NPS guidance development related to program quality assurance. Serves on planning team for NPS projects. Participates in the development, approval, implementation, and maintenance of the QAPP.

**Rebecca Ross**

**NPS Data Manager**

Responsible for coordination and tracking of NPS data sets from initial submittal through NPS Project Manager review and approval. Ensures that data is reported following instructions in the Surface Water Quality Monitoring Data Management Reference Guide (January 2012, or most current version). Runs automated data validation checks in SWQMIS and coordinates data verification and error correction with NPS Project Managers' data review. Generates SWQMIS summary reports to assist NPS Project Managers' data reviews. Provides training and guidance to NPS and Planning Agencies on technical data issues. Reviews QAPPs for valid stream monitoring stations. Checks validity of parameter codes, submitting entity code(s), collecting entity code(s), and monitoring type code(s). Develops and maintains data management-related standard operating procedures for NPS data management. Serves on planning team for NPS projects.

**Brazos River Authority**

**Jeff Sammon**

**Brazos River Authority Project Manager**

Responsible for ensuring tasks and other requirements in the contract are executed on time and are of acceptable quality. Monitors and assesses the quality of work. Coordinates attendance at conference calls, training, meetings, and related project activities with the TCEQ. Responsible for verifying the QAPP is followed and the project is producing data of known and acceptable quality. Ensures adequate training and supervision of all monitoring and data collection activities. Complies with corrective action requirements.

**Kay Barnes**

**Brazos River Authority QAO**

Responsible for coordinating development and implementation of the QA program. Responsible for writing and maintaining the QAPP. Responsible for maintaining records of 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 quality assurance records. Responsible for coordinating with the TCEQ QAS to resolve QA-related issues. Notifies the contractor Project Manager and TCEQ Project Manager of particular circumstances which may adversely affect the quality of data. Responsible for validation and verification of all data collected according with Table 4

procedures and acquired data procedures after each task is performed. Coordinates the research and review of technical QA material and data related to water quality monitoring system design and analytical techniques. Conducts laboratory inspections. Develops, facilitates, and conducts monitoring systems audits.

**Tiffany Morgan**

**Environmental and Compliance Manager**

Responsible for supervision of the Field Operations Supervisor and the Laboratory Manager.

**Jenna Barrett**

**BRA Clean Rivers Program Project Manager**

Responsible for administration of the Clean Rivers Program for the Brazos River Authority.

**Kay Barnes**

**Brazos River Authority Data Manager**

Responsible for the acquisition, verification, and transfer of data to the TCEQ. Oversees data management for the study. Performs data quality assurances prior to transfer of data to TCEQ. Responsible for transferring data to the TCEQ in the Event/Result file format specified in the DMRG. Ensures data are submitted according to workplan specifications. Provides the point of contact for the TCEQ Data Manager to resolve issues related to the data.

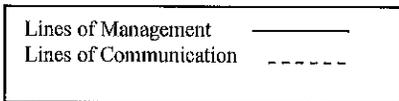
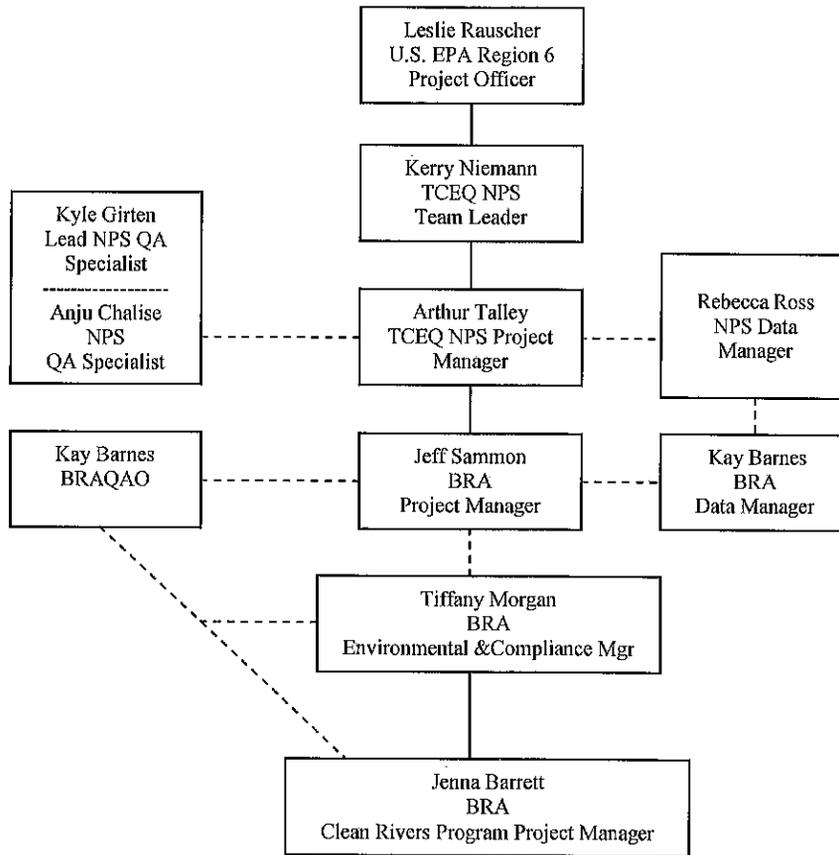
**U.S. EPA Region 6**

**Leslie Rauscher**

**EPA Project Officer**

Responsible for managing the CWA Section 319 funded grant on the behalf on EPA. Assists the TCEQ in approving projects that are consistent with the management goals designated under the State's NPS management plan and meet federal guidance. Coordinates the review of project workplans, draft deliverables, and works with the State in making these items approvable. Meets with the State at least semi-annually to evaluate the progress of each project and when conditions permit, participate in a site visit on the project. Fosters communication within EPA by updating management and others, both verbally and in writing, on the progress of the State's program and on other issues as they arise. Assists the regional NPS coordinator in tracking a State's annual progress in its management of the NPS program. Assists in grant close-out procedures ensuring all deliverables have been satisfied prior to closing a grant.

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



## **A5 Problem Definition/Background**

### ***Problem Statement***

For a long period of time, water quality conditions sometimes fail to meet criteria set for contact recreation use based on elevated concentrations of *E. coli* and fecal coliform bacteria found in the coves of Lake Granbury. A substantial portion of the developed area around Lake Granbury, which lies wholly within Hood County, consists of unincorporated subdivisions that do not have sewage collection systems and centralized sewage treatment facilities. There are an estimated 9,000 septic tanks located around Lake Granbury with absorption fields installed on small lots in close proximity to the lake. Most of the inhabited areas around the lake exist on man-made canals. The canals are shallow, dead-end bodies of water with little mixing or interaction with the main body of the reservoir. New development in areas without collection and treatment systems relies on individual on-site septic tanks and absorption fields.

In response to stakeholder concerns, BRA began a large-scale monitoring initiative in the coves of Lake Granbury to assess the water quality of the coves. Beginning in May 2001, BRA began collecting water quality samples on a monthly basis at over 50 cove locations. Some of the locations showed no elevated concentrations of *E. coli* and were later discontinued. Some locations were added after a year of monitoring as new information was acquired on possible source locations. The data generated from this effort indicates that many of the coves on Lake Granbury are impacted by *E. coli* issues and indicate a concern for public health and contact recreation. The data also indicates that the water quality in the coves is most influenced by the surrounding land use, rather than by the main body of the lake.

Declining water quality in the coves has begun to negatively affect the contact recreation use of the coves. Twelve incidents of waterborne illness have been reported to the Texas Department of State Health Services from Hood County from 2006 through May, 2010 with increasing numbers each year. Lake Granbury is the lifeblood of Hood County, with the majority of the county's communities relying on the lake for drinking water, irrigation, industry, and recreation. The economy in Hood County is closely tied to Lake Granbury, and the environmental condition of the lake is crucial to the county's residents. In 2006, TCEQ and BRA initiated an effort to develop the Lake Granbury WPP to reduce bacteria levels in the lake and its coves.

## **A6 Project/Task Description**

### **Project Description**

Lake Granbury's Watershed Protection Plan implementation schedule was included in the Plan, as well as a description of interim, measurable milestones for determining whether NPS management measures or other control actions are being implemented. The Plan includes a set of criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made toward meeting the WPP goal. Monitoring the effectiveness of the implementation efforts over time will be used to measure against the goal established in the WPP. The Brazos River Authority (BRA) will work closely with local stakeholders to leverage SRF loan dollars from the Texas Water Development Board to build a WWTP, if point source solutions are incorporated in the Plan to rectify nonpoint source loadings. These planning efforts may be proposed by BRA in planning stages.

### **Routine Water Quality Monitoring**

Under TCEQ Clean Rivers Program, the Authority will conduct monthly sampling at 3 Main body Lake Granbury stations, 8 Lake Granbury cove stations and 5 stations in tributary creeks for *E. coli*. The data from this routine monitoring will be assessed against the Granbury WPP Stakeholders goal of 53 mpn/100ml to provide a pre implementation and post implementation data set to determine if the BMPs have been effective.

**CONSISTENCY WITH TEXAS NONPOINT SOURCE POLLUTION MANAGEMENT PROGRAM:** This project supports the *Texas Nonpoint Source Management Program Long-Term Goal* of protecting and restoring water quality from nonpoint source pollution by: 1) focusing available resources in watersheds impacted by nonpoint source pollution; and, 2) developing a Watershed-based Plan that includes assessment, implementation, and education activities in an effort to restore water quality from nonpoint source pollution.

This project also supports the *Texas Nonpoint Source Management Program Short-Term Goals* of assessment and implementation by: 1) conducting assessment activities to determine the effect of the nonpoint source pollution; 2) implementing BMPs that can be put in place during the development of the Watershed Protection Plan; 3) conducting outreach efforts that will help to educate and initiate action at the local level; and 4) determining which BMPs should be used in the watershed.

See Appendix B for the project-related work plan tasks related to data acquisition and schedule of deliverables for a description of work defined in this QAPP.

### **QAPP ANNUAL REVISION**

Until the work described is completed, this QAPP shall be revised as necessary and reissued annually on or prior to the anniversary date, or revised and reissued within 120 days of significant changes, whichever is sooner. The revision must be submitted to the TCEQ for

approval at least 90 days before the last approved version has expired. If the entire QAPP is current, valid, and accurately reflects the project goals and the organization's policy, the annual re-issuance may be done by a certification that the plan is current. This can be accomplished by submitting a cover letter stating the status of the QAPP and a copy of new, signed approval pages for the QAPP. Environmental work described in this QAPP must be put "on hold" if the QAPP expires and a revision has not been approved.

### **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 from the BRA Project Manager to the TCEQ Project Manager in writing using the QAPP Amendment shell. The changes are effective immediately upon approval by the TCEQ NPS Project Manager and Quality Assurance Specialist, or their designees, and the EPA Project Officer (if necessary).

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 BRA 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.

### **A7 Quality Objectives and Criteria**

No data will be collected directly under this QAPP. Quality Objectives and criteria for data acquired are specified in "Clean River Project Quality Assurance Project Plan" effective FY2012 to FY2013.

### **A8 Special Training/Certification**

No data collection will be occurring directly under this QAPP therefore field training is not required.

**A9 Documents and Records**

**Table A9.1 Project Documents and Records**

Document/Record	Location	Retention (yrs)	Format
QAPPs, amendments and appendices	BRA Central Files QAO office and computer network	7	Paper and electronic (pdf)
QAPP distribution documentation	BRA Central Files and computer network	7	Paper and electronic (pdf)
Corrective Action Documentation	BRA Central Files and computer network / DHL	7	Paper and electronic (excel spreadsheet)

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

No data will be collected directly under this QAPP. Quality Objectives and criteria for data acquired are specified in “Clean River Project Quality Assurance Project Plan” effective FY2012 to FY2013.

**B2 Sampling Methods**

No data will be collected directly under this QAPP. Quality Objectives and criteria for data acquired are specified in “Clean River Project Quality Assurance Project Plan” effective FY2012 to FY2013.

**B3 Sample Handling and Custody**

No data will be collected directly under this QAPP. Quality Objectives and criteria for data acquired are specified in “Clean River Project Quality Assurance Project Plan” effective FY2012 to FY2013.

**B4 Analytical Methods**

No data will be collected directly under this QAPP. Quality Objectives and criteria for data acquired are specified in “Clean River Project Quality Assurance Project Plan” effective FY2012 to FY2013.

### **B5 Quality Control**

No data will be collected directly under this QAPP. Quality Objectives and criteria for data acquired are specified in “Clean River Project Quality Assurance Project Plan” effective FY2012 to FY2013.

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

No data will be collected directly under this QAPP. Quality Objectives and criteria for data acquired are specified in “Clean River Project Quality Assurance Project Plan” effective FY2012 to FY2013.

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

No data will be collected directly under this QAPP. Quality Objectives and criteria for data acquired are specified in “Clean River Project Quality Assurance Project Plan” effective FY2012 to FY2013.

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

No data will be collected directly under this QAPP. Quality Objectives and criteria for data acquired are specified in “Clean River Project Quality Assurance Project Plan” effective FY2012 to FY2013.

**B9 Non-direct Measurements**

This project will include the use of routine data obtained from non-direct measurement through Clean River Program. Section D3 discusses the use of the non-direct measured data.

**Table B9.1 Lake Granbury Stations monitored for Clean Rivers Program**

Station ID	Site Description	Latitude / Longitude	Start Date	End Date	Sample Matrix	Monitoring Frequencies (per year)			Comments
						Conventional Parameters	E. coli	Field Parameters	
11860	LAKE GRANBURY NEAR DAM 102 METERS WEST AND 56 METERS NORTH OF NORTHERN EDGE OF DAM SITE AC USGS 322227097412101	32.374168 / -97.688889	3/1/2012	5/31/2014	Water	12	12	12	Lake
20307	LAKE GRANBURY IMMEDIATELY UPSTREAM OF ATCHISON TOPEKA AND SANTA FE RAILROAD 110 METERS UPSTREAM OF US377/EAST PEARL STREET EAST OF GRANBURY	32.442963 / -97.767409	3/1/2012	5/31/2014	Water	12	12	12	Lake
11862	LAKE GRANBURY AT FM 51 NORTH OF GRANBURY 265 METERS WEST AND 69 METERS NORTH OF INTERSECTION OF FM 51 AND SIESTA COURT	32.475227 / -97.787552	3/1/2012	5/31/2014	Water	12	12	12	Lake
18004	UNNAMED CANAL ON LAKE GRANBURY AT THE LOW-WATER CROSSING ON BEDFORD DRIVE, 255 M FROM THE INTERSECTION WITH INDIAN GAP STREET	32.536194 / -97.831581	3/1/2012	5/31/2014	Water	12	12	12	Cove

Station ID	Site Description	Latitude / Longitude	Start Date	End Date	Sample Matrix	Monitoring Frequencies (per year)			Comments
						Conventional Parameters	E. coli	Field Parameters	
18010	UNNAMED CANAL ON LAKE GRANBURY AT 3709 GREENBROOK DRIVE	32.485752 / -97.816803	3/1/2012	5/31/2014	Water	12	12	12	Cove
18015	UNNAMED CANAL ON LAKE GRANBURY 127 M SOUTH, 24 M EAST OF INTERSECTION OF APOLLO COURT AND SKY HARBOUR DRIVE	32.492001 / -97.777054	3/1/2012	5/31/2014	Water	12	12	12	Cove
18038	UNNAMED CANAL ON LAKE GRANBURY 95 M EAST-SOUTHEAST OF INTERSECTION OF HARTWOOD DRIVE AND EAST FERNWOOD COURT	32.414528 / -97.705193	3/1/2012	5/31/2014	Water	12	12	12	Cove
18741	LAKE GRANBURY IN CANAL 296 M NORTH AND 145 M WEST OF KRUSE COURT AT BLUE WATER CIRCLE	32.389759 / -97.700661	3/1/2012	5/31/2014	Water	12	12	12	Cove
18018	UNNAMED CANAL ON LAKE GRANBURY 130 M NORTH NORTHWEST OF THE INTERSECTION OF MALLARD WAY AND MALLARD COURT	32.421749 / -97.773521	3/1/2012	5/31/2014	Water	12	12	12	Cove
20216	UNNAMED CANAL ON LAKE GRANBURY 135 M NORTH AND 130 M EAST OF THE INTERSECTION OF DAKOTA TRAIL AND	32.40694 / -97.758	3/1/2012	5/31/2014	Water	12	12	12	Cove

Station ID	Site Description	Latitude / Longitude	Start Date	End Date	Sample Matrix	Monitoring Frequencies (per year)			Comments
						Conventional Parameters	E. coli	Field Parameters	
	CONEJOS COURT								
20229	WALNUT CREEK WEST BANK AT FAIRWAY DRIVE IN DECORDOVA ESTATES	32.42975 / -97.69628	3/1/2012	5/31/2014	Water	12	12	12	Cove
20218	CONTRARY CREEK 10 M SOUTH AND 114 M WEST OF SOUTH CHISHOLM TRAIL AT ZUNI COURT APPROXIMATE LY 90 M UPSTREAM OF LAKE GRANBURY	32.40115 / -97.75588	3/1/2012	5/31/2014	Water	12	12	12	Tributary
20220	LONG CREEK AT TERMINUS OF LONG CREEK COURT NEAR FM 51 NORTH OF GRANBURY	32.528063 / -97.816135	3/1/2012	5/31/2014	Water	12	12	12	Tributary
20227	ROBINSON CREEK AT LAKE GRANBURY HARBOR BOAT RAMP 514 M UPSTREAM OF FM 2580 BRIDGE	32.50601 / -97.85108	3/1/2012	5/31/2014	Water	12	12	12	Tributary
20228	STROUDS CREEK AT THE SOUTH END OF CARAWAY STREET IN THORP SPRINGS	32.468046 / -97.822271	3/1/2012	5/31/2014	Water	12	12	12	Tributary
20230	BRAZOS RIVER AT TURKEY CREEK CONFLUENCE AT LAKE COUNTRY ACRES NEAR FM 51	32.55885 / -97.79691	3/1/2012	5/31/2014	Water	12	12	12	Tributary

Reservoir stage data are collected every day from United States Geological Society (USGS), International Boundary Water Commission (IBWC), and United States Army Corps of Engineers (USACE) websites. These data are preliminary and subject to revision. The Texas Water

Development Board (TWDB) derives Reservoir storage (in acre-feet) from these stage data (elevation in feet above mean sea level), by using the latest rating curve datasets available.

These data are published on the TWDB website at <http://wiid.twdb.state.tx.us/ims/resinfo/BushButton/lakeStatus.asp?selcat=3&slbasin=2>.

The web application uses real time gaged observations 7 AM reading each day (or closest reading available) from 119 major reservoirs to approximate daily storage for each reservoir, as well as daily total storage for water planning regions, river basins and the state of Texas. These instantaneous data are updated to mean daily data for all previous days. These data will be submitted to the TCEQ under parameter code 00052 Reservoir Stage and parameter code 00053 Reservoir Percent Full.

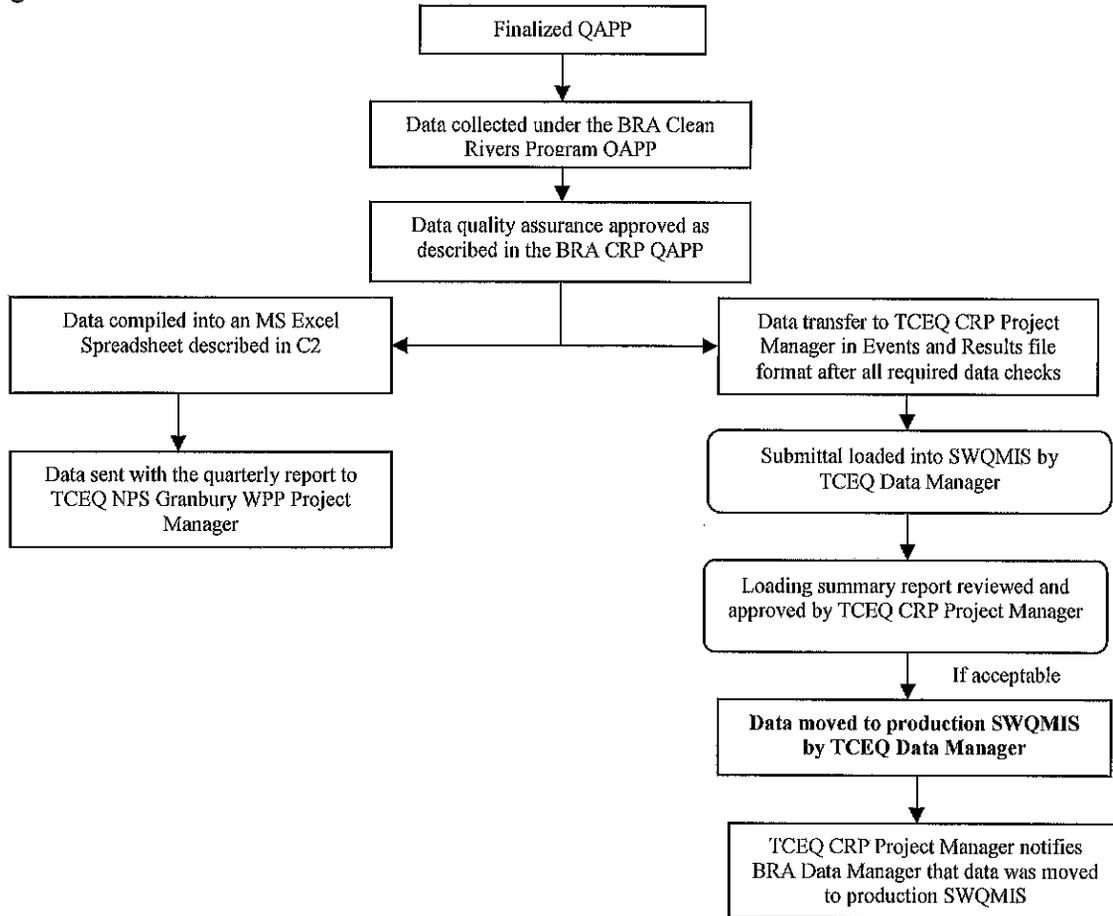
The watershed coordinator will develop and evaluate instruments to circulate at selected outreach events for feedback on effectiveness of outreach presentations. An annual survey will be circulated to the Granbury Watershed stakeholder group to seek comments and input on the Granbury Watershed project.

**Table B9.2 Parameters Collected under Clean Rivers Program QAPP**

Parameter	Units	Matrix	Method	Parameter Code	AWRL	LOQ	Lab	Project
TEMPERATURE, WATER (DEGREES CENTIGRADE)	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	NA*	NA	BRA	CRP
TRANSPARENCY, SECCHI DISC (METERS)	meters	water	TCEQ SOP V1	00078	NA	NA	BRA	CRP
SPECIFIC CONDUCTANCE, FIELD (uS/CM @ 25C)	us/cm	water	EPA 120.1 and TCEQ SOP, V1	00094	NA	NA	BRA	CRP
OXYGEN, DISSOLVED (MG/L)	mg/L	water	SM 4500-O G and TCEQ SOP, V1	00300	NA	NA	BRA	CRP
PH (STANDARD UNITS)	s.u	water	EPA 150.1 and TCEQ SOP, V1	00400	NA	NA	BRA	CRP
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	0.05	0.04	BRA	CRP
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	5	BRA	CRP
SULFATE (MG/L AS SO4)	mg/L	water	EPA 300.0, Rev. 2.1 (1993)	00945	5	5	BRA	CRP
ORTHOPHOSPHATE PHOSPHORUS, DISS, MG/L, FLDFILT<15MIN	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00671	0.04	0.04	BRA	CRP
E. coli	MPN/100mls	Water	Idexx - Colilert	31699	1	1	BRA	CRP

**B10 Data Management**

Figure B10.0 Data Flow Path



**Personnel**

Section A4 lists responsibilities and lines of communication for data management personnel.

**C1 Assessments and Response Actions**

The following table presents the types of assessments and response actions for data collection activities applicable to the QAPP.

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

<b>Assessment Activity</b>	<b>Approximate Schedule</b>	<b>Responsible Party</b>	<b>Scope</b>	<b>Response Requirements</b>
Status Monitoring Oversight, etc.	Continuous	Contractor Project Manager	Monitoring of the project status and records to ensure requirements are being fulfilled.	Report to TCEQ in Quarterly Report
Monitoring Systems Audit	Dates to be determined by TCEQ	TCEQ QAS	The assessment will be tailored in accordance with objectives needed to assure compliance with the QAPP. Field sampling, handling and measurement; facility review; and data management as they relate to the NPS Project	30 days to respond in writing to the TCEQ to address corrective actions
Monitoring Systems Audit	Based on work plan and or discretion of contractor	BRA QAO	The assessment will be tailored in accordance with objectives needed to assure compliance with the QAPP. Field sampling, handling and measurement; facility review; and data management as they relate to the NPS Project	30 days to respond in writing to the contractor QAO to address corrective actions
Site Visit	Dates to be determined by TCEQ	TCEQ PM	Status of activities. Overall compliance with work plan and QAPP	As needed

**Corrective Action Process for Deficiencies**

Deficiencies are any deviation from the QAPP, It is the responsibility of the BRA Project Manager, in consultation with the BRA QAO, to ensure that the actions and resolutions to the problems are documented and that records are maintained in accordance with this QAPP. In addition, these actions and resolutions will be conveyed to the NPS Project Manager both verbally and in writing in the project progress reports and by completion of a corrective action plan (CAP).

**Corrective Action**

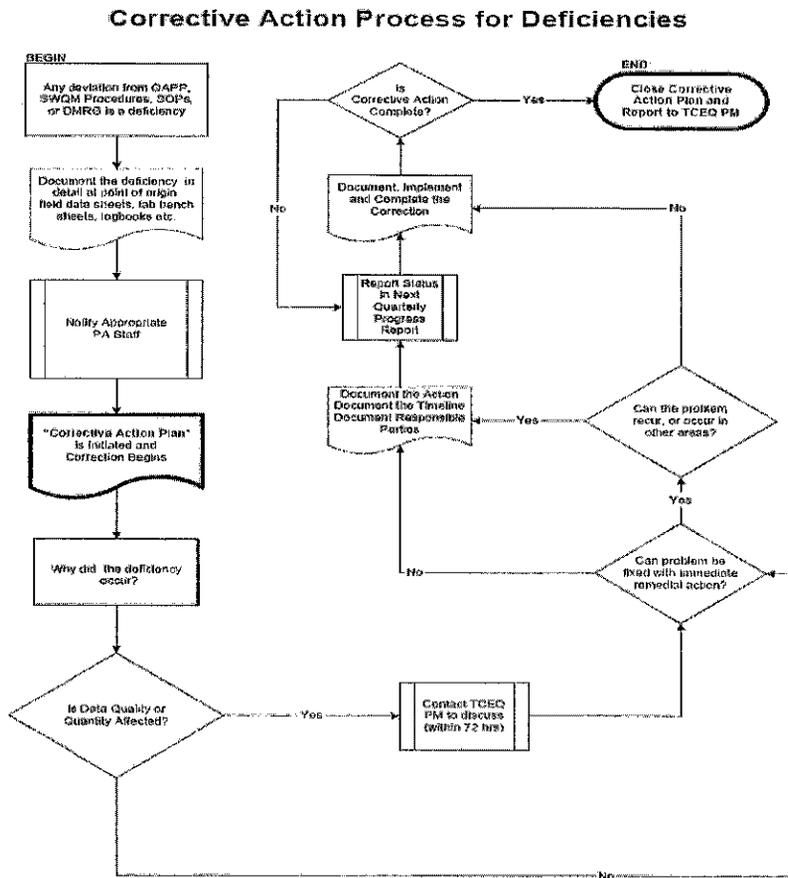
CAPs should:

- Identify the problem, nonconformity, or undesirable situation
- Identify immediate remedial actions if possible
- Identify the underlying cause(s) of the problem
- Identify whether the problem is likely to recur, or occur in other areas

- Evaluate the need for Corrective Action
- Use problem-solving techniques to verify causes, determine solution, and develop an action plan
- Identify personnel responsible for action
- Establish timelines and provide a schedule
- Document the corrective action

To facilitate the process a flow chart has been developed (see figure C1.1: Corrective Action Process for Deficiencies).

**Figure C1.1 Corrective Action Process for Deficiencies**



Status of CAPs will be documented on the Incident Reporting Spreadsheet (See Appendix D) and 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 TCEQ immediately.

The BRA QAO is responsible for implementing and tracking corrective actions. Corrective action plans will be documented on the Corrective Action Plan Form (See Appendix E) and submitted,

when complete, to the TCEQ Project Manager upon request. Records of audit findings and corrective actions are maintained by both the TCEQ and the BRA QAO. Audit reports and corrective action documentation will be submitted to the TCEQ with the Quarterly Progress Report.

If audit findings and corrective actions cannot be resolved, then the authority and responsibility for terminating work are specified in the TCEQ QMP and in agreements in contracts between participating organizations.

## **C2 Reports to Management**

### **Reports to TCEQ Project Management**

All reports detailed in this section are contract deliverables and are transferred to the TCEQ in accordance with contract requirements.

Monitoring Systems Audit Report and Response - Following any audit performed by the Basin Planning Agency, a report of findings, recommendations and response is sent to the TCEQ in the quarterly progress report.

Quarterly Progress Report - Summarizes the Contractor's activities for each task; reports monitoring status, problems, delays, and corrective actions; and outlines the status of each task's deliverables. A MS Excel Spreadsheet of the data collected under the BRA Clean Rivers Program QAPP will be included with the quarterly progress report.

Monitoring System Audit Response - The contractor will respond in writing to the TCEQ within 30 days upon receipt of a monitoring system audit report to address corrective actions.

Contractor Evaluation - The Contractor participates in a Contractor Evaluation by the TCEQ annually for compliance with administrative and programmatic standards.

Final Project Report - Summarizes the Contractor's activities for the entire project period including a description and documentation of major project activities; evaluation of the project results and environmental benefits; and a conclusion.

Draft Report – BRA will provide a draft report summarizing all project activities, findings, and the contents of all previous deliverables, referencing and/or attaching them as web links or appendices. This comprehensive, technical report will provide analysis of all activities and deliverables under these Grant Activities. The report will include the following information:

- Title;
- Table of Contents;
- Executive Summary;
- Introduction;
- Project Significance and Background;

- Methods;
- Results and Observations;
- Discussion;
- Summary;
- References; and
- Appendices.

Final Report – BRA will revise the draft report to address comments provided by the TCEQ Project Manager. The final report will be submitted to the TCEQ Project Manager and subsequently to EPA.

### **Reports to BRA Project Management**

The Quality Assurance manager reports E. coli results to the BRA Project Manager monthly following approval of the data. The report contains the following information:

- Station number
- Subdivision
- Site name
- Collect Date
- Collect Time
- Result

### **Reports by TCEQ Project Management**

Contractor Evaluation - The BRA participates in a Contractor Evaluation by the TCEQ annually for compliance with administrative and programmatic standards. Results of the evaluation are submitted to the TCEQ Financial Administration Division, Procurement and Contracts Section.

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

For the purposes of this document, data verification is a systematic process for evaluating performance and compliance of a set of data to ascertain its completeness, correctness, and consistency using the methods and criteria defined in the QAPP.

No data will be collected directly under this QAPP. Quality Objectives and criteria for data acquired are specified in “Clean River Project Quality Assurance Project Plan” effective FY2012 to FY2013.

### **D2 Verification and Validation Methods**

No data will be collected directly under this QAPP. Quality Objectives and criteria for data acquired are specified in "Clean River Project Quality Assurance Project Plan" effective FY2012 to FY2013.

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

The BMPs proposed by the Granbury Watershed Stakeholders under the WPP are primarily education and outreach. Given the existing, low, *E. coli* concentrations in the main body of the lake, it is not anticipated education and outreach will result in an observable decrease in *E. coli* concentrations. The effectiveness of the education and outreach will be determined by a reduction in the *E. coli* values in the coves. The coves are smaller, isolated areas where implementation of improved land management strategies learned through education and outreach can have an observable impact on *E. coli* concentrations (i.e. increased maintenance of existing OSSFs).

Data collected from this project will be analyzed by the Granbury Watershed Stakeholders to report the performance of the education and outreach program as evaluated through instream reductions in *E. coli*. In-stream monitoring data that do not meet data quality requirements specified in the BRA Clean Rivers Program QAPP will not be used in the project.

The data from this routine monitoring will be assessed against the Granbury WPP Stakeholders goal of 53 mpn/100ml to provide a pre-implementation and post-implementation data set to determine if the education and outreach programs have been effective in leading to land management changes that result in reduced instream *E. coli* concentrations.

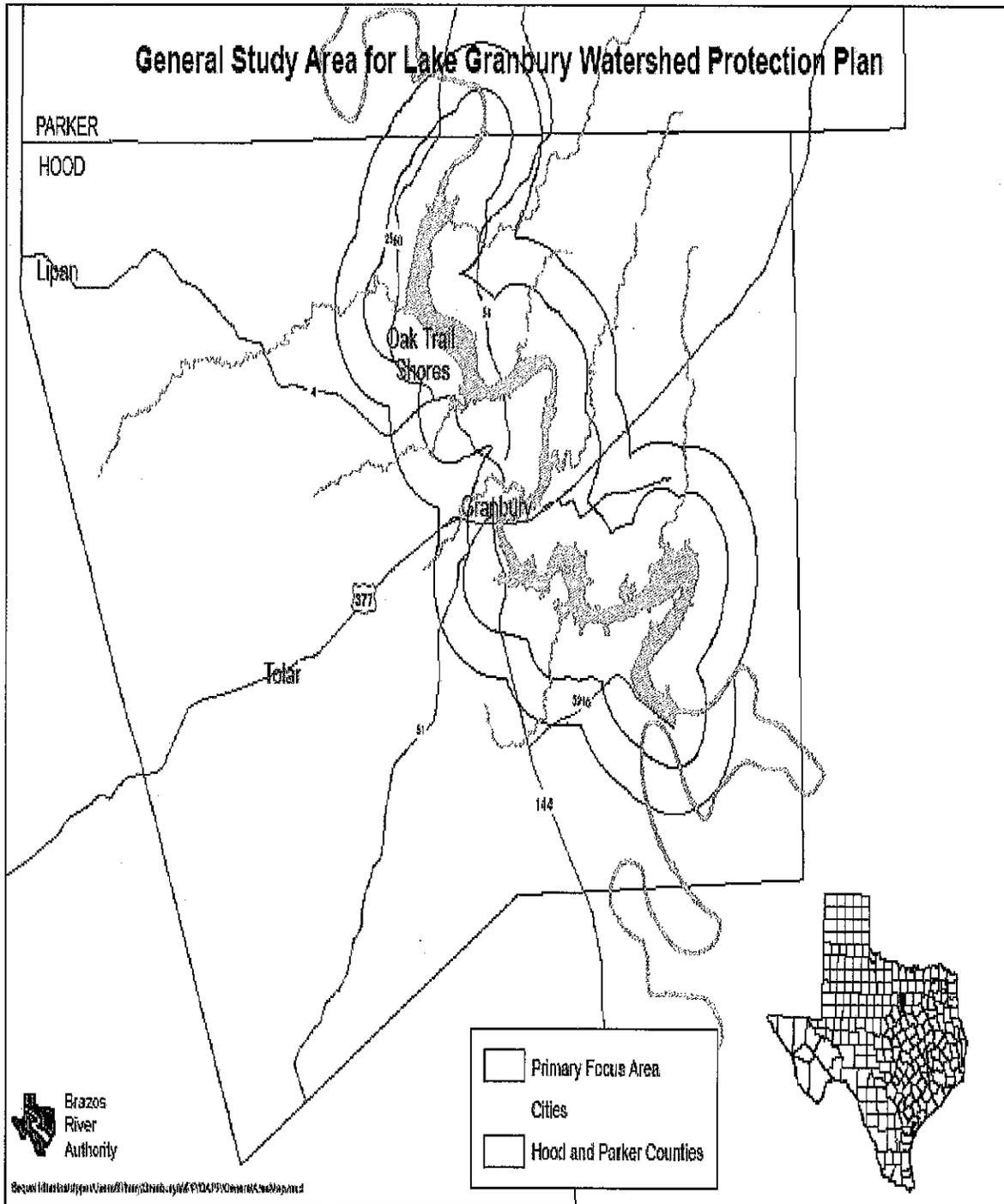
While literature or studies are not available to translate educational effectiveness to load reduction effectiveness, it is anticipated that educational programs will provide reductions in *E. coli* concentrations in two ways: (1) through increased efforts to repair and maintain OSSF systems, and (2) through increased awareness and participation in associated land management strategies to reduce bacterial runoff (e.g., pet waste or livestock manure management programs).

Education and outreach effectiveness will not be solely assessed through evaluation of *E. coli* concentrations in the canals. Education and outreach effectiveness will all also be assessed through a series of evaluation instruments completed by event attendees throughout the Education Program. Evaluation instruments will be circulated before and after select events to assess the effectiveness of program in educating participants about water quality in general, their potential individual contributions to water quality concerns, and land management practices each individual can implement to reduce their impact. Evaluation instruments will also gather information on whether the outreach program was successful convincing participants to make lifestyle changes that will benefit the watershed. Additionally, a survey instrument will be circulated annually to the LGWPPSG to assess their satisfaction with the campaign and to solicit inputs for improvements. The survey must adhere to requirements in OMB Guidance on the Paperwork Reduction Act. EPA approved the surveys to be conducted in the Lake Granbury

WPP project with their approval of the grant work plan. A database of attendees of outreach events will be developed and those attendees will be surveyed six months after the event to determine whether attendees modified their lifestyle as a result of the information provided during the event. The Outreach Campaign will be continually evaluated and suggestions from stakeholders and attendees will be incorporated to make the campaign more effective.

The evaluation instruments will make it possible to determine the percent of individuals who adjusted behaviors based on outreach activities and if these adjustments led to an observable reduction in *E. coli* concentrations in the canals.

## **Appendix A: Area Location Map**



## **Appendix B: Work Plan**

Grantee: BRA

Contract Number: 582-12-10075

NPS Statewide Lake-CWBA Special NPS Grant Program					
<b>1. Title of Project:</b>	1.04 Implementation of Selected Management Measures from the Lake Granbury WPP.				
<b>2. Project Goals:</b>	To assist and track implementation of the Lake Granbury WPP, assess effectiveness of management in improving water quality, continue facilitation of the Lake Granbury WPP Stakeholder Group (LGWPPSG), provide outreach and education requested by the LGWPPSG, and seek funding opportunities to ensure implementation of the management measures recommended in the Lake Granbury WPP.				
<b>3. Project Tasks:</b>	(1) Project Administration; (2) LGWPPSG and Executive Committee (EC) Facilitation; (3) Resource Identification, Grant Writing, and Funding Requests; (4) Interim Water Quality Monitoring; (5) Quality Assurance Project Plan for Interim Water Quality Monitoring; (6) Implementation of Education and Outreach Plan recommended in the Lake Granbury WPP.				
<b>4. Measures of Success:</b>	The overall goal of the Lake Granbury WPP is to improve the health of the lake and watershed and to eliminate the contact recreation concerns from the coves. Specific tasks have been identified as pieces of the overall plan that focus on addressing issues of concern in the watershed. Measures of Success related to this project will include: 1) obtaining funding to implement construction-based management measures; 2) continued coordination of stakeholder efforts to insure implementation of recommended NPS management measures; 3) work with local governments to produce recommended regulatory changes; and 4) increased knowledge of the general public around Lake Granbury of watershed issues and individual impacts on water quality.				
<b>5. Project Type:</b>	<b>Implementation (X); Education (X); Planning (X); Assessment (X); Groundwater ( )</b>				
<b>6. Status of Water Body: 2008 Texas Water Quality Inventory and 303(d) List</b>	<b>Segment ID:</b> 1205	<b>Parameter:</b> Bacteria	<b>Category:</b> Segment 1205 is not identified as being impaired or having a concern for bacteria. However, an intensive monitoring program of the coves on Lake Granbury which began in 2002 indicates a threat to contact recreation in the coves from elevated <i>E. coli</i> concentrations. 32% of the coves monitored exceed the single sample <i>E. coli</i> standard of 394 MPN/100mL, and 26% of the coves exceed the geometric mean goal of 53 MPN/100mL identified by the LGWPPSG.		
<b>7. Project Location (Statewide or Watershed and County)</b>	Lake Granbury watershed with strong focus on Hood County and the area within a two-mile radius of the lake.				
<b>8. Key Project Activities:</b>	<b>Hire Staff ( ); Surface Water Quality Monitoring (X); Technical Assistance (X); Education (X); Implementation (X); Best Management Practice (BMP) Effectiveness Monitoring (X); Demonstration ( ); Planning (X); Modeling ( ); Bacterial Source Tracking ( ); Other ( )</b>				
<b>9. Texas NPS Management Program Elements:</b>	Element One (LTG 1, 2, 3, 5, 6 and 7 STG Objectives 1, 2 & 3) Element Two Element Three Element Four				
<b>10. Project Costs:</b>	<b>Federal (TCEQ)</b>	\$319,119	<b>Non-Federal (Match)</b>	\$212,746	<b>Total:</b> \$531,865
<b>11. Project Management:</b>	BRA				
<b>12. Project Period:</b>	Upon signature approval of both parties – August 31, 2014				

Grantee: BRA

Contract Number: 582-12-10075

**Part I - Applicant Information**

<b>Applicant</b>							
<b>13. Project Lead</b>		Jeff Sammon					
<b>14. Title</b>		Upper Basin Environmental Planner					
<b>15. Organization</b>		BRA					
<b>16. Federal ID No.</b>		068981125					
<b>17. E-mail Address</b>		jsammon@brazos.org					
<b>18. Street Address</b>		4600 Cobbs Drive					
<b>City</b>	Waco	<b>County</b>	McLennan	<b>State</b>	TX	<b>Zip Code</b>	76710
<b>19. Tele No.</b>	254-761-3132			<b>Fax No.</b>	254-761-3222		

**20. Roles of Partners**

Names	Roles & Responsibilities
TCEQ	Provide state oversight and management of all project activities and ensure coordination of activities with related projects and the Texas State Soil and Water Conservation Board (TSSWCB)
BRA	Administer grant and conduct interim and implementation monitoring.
Texas A&M University Agrilife Research and Extension Center (Agrilife)	Hire a Watershed Coordinator, assist the LGWPPSG in pursuing funding for implementation of management measures recommended in the Lake Granbury WPP, administer an education program in the watershed, monitor and assess effectiveness of the education program on increasing knowledge of watershed issues.
LGWPPSG	The LGWPPSG is composed of 23 members instrumental in the development of the Lake Granbury WPP and is responsible for continuing to garner public support for water quality improvement in the Lake Granbury Watershed, supporting EC efforts and revising the Lake Granbury WPP as necessary.
EC	A subset of the LGWPPSG with direct involvement in the implementation of some or all of the management measures recommended in the Lake Granbury WPP. EC will meet more frequently than LGWPPSG and actively pursue funding to implement management measures.

**Part II - Project Information**

<b>Project Type</b>							
<b>21. Surface Water</b>	<input checked="" type="checkbox"/>	<b>Groundwater</b>	<input type="checkbox"/>				
<b>22. Does the project implement recommendations made in a completed WPP or an adopted Total Maximum Daily Load (TMDL) or Implementation Plan (I-Plan)?</b>				<b>Yes</b>	<input checked="" type="checkbox"/>	<b>No</b>	<input type="checkbox"/>
<b>23. If yes, identify the document.</b>		Lake Granbury WPP					

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24. If yes, identify the agency/group that developed and/or approved the document.	BRA and LGWPPSG	25. Year Developed	FY 2010
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26. Watershed Information				
Watershed Name(s)	Hydrologic Unit Code (8 Digit)	Segment ID	305 (b) Category	Size (Acres)
Lake Granbury	12060201	1205	2	1,368,320

27. Water Quality Impairments			
Describe all known causes (pollutants of concern) of water quality impairments from any of the following sources: 2008 Texas Water Quality Inventory and 303(d) List, Clean Rivers Program (CRP) Basin Summary, Basin Highlights Reports or Other Documented Sources.			
IMPAIRMENTS (2008 Texas Water Quality Inventory and 303(d) List)			
Segment 1205: Lake Granbury			
	<u>Impairment</u>	<u>Category</u>	<u>Year Listed</u>
1205_01: Upstream portion of lake	chloride	5c	2008
1205_02: Portion of lake adjacent to the City of Oak Trail Shores	chloride	5c	2008
1205_03: Portion of lake adjacent to the City of Granbury	chloride	5c	2008
1205_04: Portion of lake downstream of Granbury	chloride	5c	2008
1205_05: Downstream portion of lake	chloride	5c	2008
CRP Basin Highlights Report (2010) – identifies concern in the coves for contact recreation			
CRP Basin Summary Report (2007) – identifies concern in the coves for contact recreation			
Texas NPS Management Program (2005) – Priority waterbody for assessment and implementation			
<i>Hood County Regional Sewerage System Feasibility Study (2000)</i> – indicated that Lake Granbury's water quality concerns will become more severe as the population rises in the county unless something is done to reduce the reliance on on-site sewage facilities (OSSFs).			
<i>Survey of Conditions and Impact of Septic Tank Pollution on the Water Quality in Lake Granbury (1995)</i> – Indicated that the soils in which septic tanks are installed around Lake Granbury are generally not well-suited for septic tanks and absorption fields. Also discovered that almost all on-site sewage facilities around the lake include absorption fields that do not provide a capacity that would comply with current State criteria.			
<i>On-site Wastewater Treatment Units at Lake Granbury and the Possible Impact Upon Water Quality of the Lake Study (1993)</i> – Identifies the most notable areas of concern for bacteria impairment to be the coves of the lake.			
Texas Department of State Health Services Monthly Epidemiology Reports - Identifies twelve incidents of waterborne illness recorded in Hood County from 2006 through May, 2010. The list of waterborne diseases that are reportable in the state of Texas, and accounted for in the monthly reports, include: Amebiasis, Campylobacteriosis, Cryptosporidiosis and Shigellosis.			

28. Problem/Need Statement
<p>A long-term concern for water quality, specifically a bacteria concern, has existed at Lake Granbury due to the high incidence of historical man-made cove development and reliance on OSSFs for wastewater disposal. A substantial portion of the developed area around Lake Granbury does not have sewage collection and treatment facilities. There are eight permitted wastewater treatment plants in Hood County and the population served by the existing permitted facilities is estimated to be less than 50 percent of the current county population. Development in areas without collection and treatment systems currently relies on either holding tanks or OSSFs and absorption fields. There are an estimated 9,000 septic systems located around Lake Granbury. Most of the inhabited areas around the lake are on man-made coves. The man-made coves are shallow, dead-end bodies of water with little mixing or interaction with the main body of the reservoir.</p> <p>Many historical studies of Lake Granbury have been conducted and all indicate that poor soil conditions, age of OSSFs, small lot sizes, and growing lakeside population will lead to more severe water quality concerns unless action is taken. In 2001, the 77<sup>th</sup> Texas Legislature formed the Lake Granbury Water Improvement District. The new district encompassed all of Hood County and was granted powers to collect, transport, process, dispose of, and control all domestic, industrial and communal wastes. The formation of the district, which would have taxing authority, was subject to a confirmation election. The confirmation election was held in May 2002, but the district failed to be confirmed by the voters of Hood County. Post-election polling revealed that voters felt that the taxes to fund the</p>

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district and the regional wastewater system would be too high and that there was not sufficient data documenting water quality concerns in the coves to justify the expenditure.

In response to stakeholder concerns, BRA began a large-scale monitoring initiative in the coves of Lake Granbury to assess the water quality of the coves. Beginning in May 2001, BRA began collecting water quality samples on a monthly basis at over 50 cove locations. Some of the locations showed no elevated concentrations of *E. coli* and were later discontinued. Some locations were added after a year of monitoring as new information was acquired on possible source locations. The data generated from this effort indicates that many of the coves on Lake Granbury are impacted by *E. coli* issues and indicate a concern for public health and contact recreation. The data also indicates that the water quality in the coves is most influenced by the surrounding land use, rather than by the main body of the lake.

Declining water quality in the coves has begun to negatively affect the contact recreation use of the coves. Twelve incidents of waterborne illness have been reported to the Texas Department of State Health Services from Hood County from 2006 through May, 2010 with increasing numbers each year. Lake Granbury is the lifeblood of Hood County, with the majority of the county's communities relying on the lake for drinking water, irrigation, industry, and recreation. The economy in Hood County is closely tied to Lake Granbury, and the environmental condition of the lake is crucial to the county's residents. In 2006, TCEQ and BRA initiated an effort to develop the Lake Granbury WPP to reduce bacteria levels in the lake and its coves.

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

This project describes tasks necessary for TCEQ, its partner agencies and its contractors, and the LGWPPSG to facilitate implementation of the Lake Granbury WPP to address elevated bacteria levels in the coves of Lake Granbury. The Lake Granbury WPP is a "community-driven" plan that reflects the local LGWPPSG's concerns, water quality data and the LGWPPSG's selected management measures. The overall objective of the Lake Granbury WPP is to reduce bacterial contamination in the coves in order to ensure safe contact recreation use and to adopt a bacteria concentration goal for the coves that will be protective of contact recreation use of Lake Granbury and its coves into the future. This plan identifies the shared vision of watershed residents, local governments, state agencies and elected officials. LGWPPSG input has been used at all stages of the Lake Granbury WPP development to determine the source identification activities performed, develop specific water quality goals for Lake Granbury, and determine what management measures can most effectively be used to protect water quality for future generations.

The LGWPPSG selected three types of NPS management measures for inclusion in the Lake Granbury WPP: local orders/ordinances and Homeowner's Association (HOA) regulations; physical management measures; and, a broad educational program. The recommended local orders/ordinances include, but are not limited to, a County Order requiring residents whose properties are in the 100-yr floodplain to submit proof annually of routine maintenance of holding tanks to the Hood County Health Department (HCHD), and restrictions on feeding wildlife and waterfowl. Recommended HOA regulations include requiring consultation on property expansions prior to the HOA approving the property expansion. The physical management measures include stormwater retention ponds, alteration of drainage patterns in specified areas, and alteration of cove dynamics in specified areas. The education plan includes development and delivery of programs including OSSF maintenance education, gray water education, septic tank verification and testing education for home inspectors, pet waste management, wildlife/waterfowl feeding, feral hog control education, manure management education, live stock/range management education, small acreage landowner education, and fertilizer application education.

Due to the technical nature of most of the LGWPPSG selected NPS management measures and the level of funding required to implement these measures, the LGWPPSG is requesting a Watershed Coordinator for the watershed as described in this project. This project provides support for the Watershed Coordinator who will assist LGWPPSG's and local governments in implementing the NPS management measures identified in the Lake Granbury WPP. The Watershed Coordinator will help the LGWPPSG and local governments:

- Prepare grant and low-interest loan applications for Stakeholders;
- Help local governments write of local orders and ordinances;
- Help HOAs write regulations;
- Assess milestones, loading reduction and progress towards achievement of the Lake Granbury WPP goals; and
- Implement the Education Plan requested by the LGWPPSG's.

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Tasks, Objectives, and Deliverables (Tasks, Objectives, and Deliverables are bolded)	
<b>Task 1:</b>	<b>Project Administration</b>
<b>Objective:</b>	To effectively administer, coordinate, and monitor all work performed under this project including technical and financial supervision and preparation of status reports.
<b>Subtask 1.1:</b>	<b>Project Oversight</b> – BRA will provide technical and fiscal oversight of the staff and/or subgrantee(s)/ subcontractor(s) to ensure Tasks and Deliverables are acceptable and completed as scheduled and within budget. With the TCEQ Project Manager authorization, BRA may secure the services of subgrantee(s)/ subcontractor(s) as necessary for technical support, repairs and training. Project oversight status will be provided to TCEQ with the Quarterly Progress Reports (QPRs).
<b>Subtask 1.2:</b>	<b>QPRs</b> —Progress will be reported to TCEQ by the 15 <sup>th</sup> of the month following each state fiscal quarter for incorporation into the Grant Reporting and Tracking System (GRTS). The Reports are to include the following: <ul style="list-style-type: none"> <li>• Status of deliverables for each task; and</li> <li>• A narrative description in Progress Report format.</li> </ul>
<b>Subtask 1.3:</b>	<b>Reimbursement Forms</b> - Reimbursement forms will be submitted to TCEQ by the last day of the month following each state fiscal quarter. For the last reporting period of the project, Reimbursement Forms are required on a monthly basis, specifically for the months of June, July, and August.
<b>Subtask 1.4:</b>	<b>Contract Communication</b> – BRA will participate in a post-award orientation meeting with TCEQ within 30 days of contract execution. BRA will maintain regular telephone and/or email communication with the TCEQ Project Manager regarding the status and progress of the project in regard to any matters that require attention between QPRs. This will include a call or meeting each January, April, July, and October. Minutes recording the important items discussed, and decisions made, during each call will be attached to each QPR. Matters that must be communicated to the TCEQ Project Manager in the interim between QPRs may include: <ul style="list-style-type: none"> <li>• Requests for prior approval of activities or expenditures for which the contract requires advance approval or that are not specifically included in the Grant Activities; and</li> <li>• Notification in advance when BRA has scheduled public meetings or events, initiation of construction, or other major task activities under this contract.</li> </ul> <p>Information regarding events or circumstances that may require changes to the budget, Grant Activities, or schedule of deliverables must be reported within 48 hours of discovery.</p>
<b>Subtask 1.5:</b>	<b>Annual Report Article</b> – BRA will provide an article for the NPS Annual Report upon request by TCEQ. This report is produced annually in accordance with Section 319(h) of the CWA, and it is used to report Texas' progress toward meeting the CWA § Section 319 goals and objectives and toward implementing its strategies as defined in the Texas NPS Management Program. The article will include a brief summary of the project and describe the activities of the past fiscal year.
<b>Deliverables</b>	<ul style="list-style-type: none"> <li>• QPRs;</li> <li>• Reimbursement Forms; and</li> <li>• An Annual Report Article.</li> </ul>

Tasks, Objectives, and Deliverables (Tasks, Objectives, and Deliverables are bolded)	
<b>Task 2:</b>	<b>Quality Assurance Project Plan (QAPP) and Interim Water Quality Monitoring</b>
<b>Objective:</b>	The LGWPPSG requested interim water quality monitoring to continue to assess conditions while implementation of management measures is pursued. To develop data quality objectives (DQOs) and quality assurance/ quality control (QA/QC) activities to ensure data of known and acceptable quality are generated through this project.
<b>Subtask 2.1:</b>	<b>QAPP Planning Meetings</b> – BRA will schedule QAPP planning meetings with the TCEQ Project Manager, Quality Assurance staff, technical staff, management, and contractors, to implement a systematic planning process, based on the elements of the TCEQ NPS QAPP Shell. The information developed during the planning meetings will be incorporated into a QAPP. Additional planning meetings may also be conducted to determine if any changes need to be made to an existing QAPP. The determination of where the data resides (and how it should be coded) will be determined during the QAPP planning meeting.
<b>Subtask 2.2:</b>	<b>QAPP</b> – BRA will develop and submit a QAPP with project specific DQOs consistent with the <i>Environmental Protection Agency (EPA) Requirements for Quality Assurance Project Plans (QA/R5)</i> format and TCEQ NPS QAPP Shell to TCEQ 120 days prior to the initiation of any data collection. The QAPP will direct all water quality data collection and activities described in Subtask 2.3. All of the water quality monitoring procedures and methods prescribed in the QAPP will be consistent with the guidelines detailed in the TCEQ Surface Water Quality Monitoring Procedures, Volume 1 and 2. The QAPP will be developed by BRA with technical assistance from the TCEQ Project Manager, Quality Assurance staff, technical staff, management, and contractors. The QAPP will be approved by TCEQ.

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<b>Subtask 2.31</b>	<p><b>Interim Water Quality Monitoring</b> - As funding is being sought to implement NPS management measures, interim-baseline monitoring will consist of monthly monitoring of three sites on the main body of the lake, eight cove sites in the most problematic areas, and five tributary streams. To monitor water quality progress during the implementation period, these sites will continue to be monitored for the following parameters:</p> <ul style="list-style-type: none"> <li>• <i>E. coli</i> - 416 samples</li> <li>• Nitrate-nitrogen - 416 samples</li> <li>• Orthophosphate-phosphorus - 416 samples</li> <li>• Chloride - 416 samples</li> <li>• Sulfate - 416 samples</li> <li>• Water temperature - minimum 416 data points, dependent on lake levels</li> <li>• Conductivity - minimum 416 data points, dependent on lake levels</li> <li>• Dissolved oxygen - minimum 416 data points, dependent on lake levels</li> <li>• Salinity - minimum 416 data points, dependent on lake levels</li> <li>• pH - minimum 416 data points, dependent on lake levels</li> </ul> <p>Numbers presented above represent the minimum number of samples and data points that will be collected; additional water quality monitoring sites may be added based on implementation status of different NPS management measures.</p> <p>The Implementation Monitoring Plan in the Lake Granbury WPP dictates that as physical NPS management measures are implemented, the number of monitoring sites in the affected area will be increased to include all impacted coves in the area for a two-year period to assess the effectiveness of the NPS management measure in reducing bacteria concentrations.</p>
<b>Subtask 2.34</b>	<b>QAPP Update</b> -BRA will provide input to TCEQ 60 days prior to the end of the effective period of the QAPP and will develop annual QAPP revisions no less than 45 days prior to the end of the effective period of the QAPP.
<b>Subtask 2.35</b>	<b>QAPP Amendments</b> - Amendments to the QAPP and the reasons for the changes will be documented by BRA and revised pages will be forwarded to all persons on the QAPP distribution list by the Contractor Quality Assurance Officer. BRA will review and approve amendments, and will incorporate the amendment into a revised QAPP during the annual revision process or within 120 days of the initial approval in cases of significant changes.
<b>Subtask 2.36</b>	<b>Data Submittals</b> -BRA will review, verify, and validate water quality monitoring data before it is submitted to TCEQ. BRA will submit data to TCEQ quarterly and at least one month prior to use, or prior to presenting to stakeholders. BRA will submit a semi-annual report of water quality data consistent with TCEQ formatting requirements for upload into the Surface Water Quality Monitoring Information System (SWQMIS).
<b>Deliverables</b>	<ul style="list-style-type: none"> <li>• QAPP Planning Meeting;</li> <li>• Draft and Final QAPP;</li> <li>• Draft and Final QAPP Annual Updates;</li> <li>• Draft and Final QAPP Amendments;</li> <li>• Data Submittals;</li> <li>• Non-conformance Reports (submitted to the TCEQ Project Manger and included in QPRs);</li> <li>• Annual water quality monitoring report; and</li> <li>• A Final water quality monitoring report.</li> </ul>

Data, objectives and schedules to be updated or modified as needed	
<b>Task 30</b>	<b>LGWPPSG Facilitation</b>
<b>Objective:</b>	BRA will contract with AgriLife who will hire the Watershed Coordinator for the Lake Granbury watershed. The Watershed Coordinator will provide a structure and encouragement for continued stakeholder participation and involvement; arrange and facilitate annual LGWPPSG meetings; and will ensure activities of stakeholders will advance the goal of implementing individual components of the Lake Granbury WPP.
<b>Subtask 3.11</b>	<p><b>Facilitate and Coordinate Meetings</b> - The Watershed Coordinator will facilitate bi-annual LGWPPSG meetings. Specifically, the Watershed Coordinator will be responsible for:</p> <ul style="list-style-type: none"> <li>• Developing agendas, arranging meeting facilities and sending e-mail notices for Annual LGWPPSG meetings;</li> <li>• Providing information requested by stakeholders prior to and following meetings;</li> <li>• Updating all LGWPPSG members on the progress of the EC in implementing management measures and of the overall implementation of the Lake Granbury WPP;</li> <li>• Facilitating a forum for open discussion among LGWPPSG meeting participants and interested parties attending the meetings; and</li> <li>• Arranging presentations by guest speakers offering useful information to Stakeholders.</li> </ul>

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<b>Subtask 3.2:</b>	<b>Update the Lake Granbury WPP Webpage with Agendas, and Meeting Materials</b> – The Watershed Coordinator will update the Lake Granbury WPP Webpage with meeting agendas, presentations, and other meeting materials within two weeks of the meeting date.
<b>Subtask 3.3:</b>	<b>Provide Bi-Monthly Email Newsletter to TCEQ, LGWPPSG and other interested parties</b> – Bi-monthly, the Watershed Coordinator will provide e-mail newsletter updates to TCEQ, LGWPPSG, and other interested parties on progress made in the implementation of the Lake Granbury WPP.
<b>Subtask 3.4:</b>	<b>Engage LGWPPSG</b> – The Watershed Coordinator will encourage participation and involvement of key stakeholders in the implementation of the Lake Granbury WPP. The Watershed Coordinator will develop a system for recognizing both the LGWPPSG and EC and individual stakeholders for implementation accomplishments. Acknowledgements will include recognition in the Bi-Monthly Email Newsletter, on the Lake Granbury WPP Webpage, and via quarterly press releases identified in Task 5.
<b>Subtask 3.5:</b>	<b>Maintain LGWPPSG List and General Public Notification List</b> – The Watershed Coordinator will maintain up-to-date lists of LGWPPSG representatives and a notification list of interested members of the general public. The lists will be submitted to TCEQ and BRA's Environmental Services Manager bi-annually.
<b>Subtask 3.6:</b>	<b>Track Implementation of NPS Management Measures as Outlined in the Lake Granbury WPP</b> – The Watershed Coordinator will assist the LGWPPSG in assessing milestones by tracking and summarizing activities and assessing progress towards achievement of Lake Granbury WPP goals. The Watershed Coordinator will produce an annual summary table indicating the implementation status of NPS management measures identified in the Lake Granbury WPP. The table will include: responsible entity, management measure, expected start date, expected end date, stage of project, assistance needed.  A quarterly summary table of grant application status including name of proposal, source of funding, Lake Granbury WPP management measure supported by the proposal, award status, anticipated start and end date of award and amount requested. Quarterly summary table will be submitted to TCEQ with the QPRs.
<b>Deliverables</b>	<ul style="list-style-type: none"> <li>• EC Meetings, monthly;</li> <li>• Bi-Annual LGWPPSG Meetings;</li> <li>• Steering Committee meeting agendas, and meeting materials on the Lake Granbury WPP website;</li> <li>• Bi-Monthly e-mail newsletters;</li> <li>• Stakeholder Recognition Program;</li> <li>• LGWPPSG list and general public notification list;</li> <li>• Annual summary table of NPS management measure implementation status;</li> <li>• Task updates in QPR;</li> <li>• Draft Report on LGWPPSG and EC Facilitation; and</li> <li>• Final Report on LGWPPSG and EC Facilitation</li> </ul>

<b>Tasks, Objectives and Schedules (or a table or grid if needed)</b>	
<b>Task 4:</b>	<b>Resource Identification, Grant Writing, and Funding Requests</b>
<b>Objective:</b>	Identify potential Federal, State, local, non-profit and private sector resources useful to the LGWPPSG for implementation of the Lake Granbury WPP and assist individual stakeholders in resource identification and grant writing for NPS management measures and projects associated with Lake Granbury WPP goals.
<b>Subtask 4.1:</b>	The Watershed Coordinator will identify potential Federal, State, local, non-profit and private sector resources that may be useful to EC members for implementation of the NPS management measures recommended in the Lake Granbury WPP. The Watershed Coordinator will gather information regarding availability and application procedures for these resources and assist individual stakeholders with grant writing for NPS management measures and projects associated with the Lake Granbury WPP goals.

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<b>Subtask 4.2:</b>	<p><b>Assist EC Members in Grant Writing and Preparing Funding Requests</b> - The Watershed Coordinator will coordinate activities with EC members to assist them in writing grants and preparing funding requests to obtain funding to implement NPS management measures in the Lake Granbury WPP. The Watershed Coordinator will:</p> <ul style="list-style-type: none"> <li>• Actively seek and pursue funding opportunities to implement NPS management measures identified in the Lake Granbury WPP;</li> <li>• Link appropriate partners, projects, and funding opportunities;</li> <li>• Assist EC members in the grant application process;</li> <li>• Assist EC members in preparation of other funding requests; and</li> <li>• Track appropriate grants that fund NPS management measures outlined in the Lake Granbury WPP.</li> </ul> <p>Potential proposals for funding to implement NPS management measures may include, but are not limited to, requests to:</p> <ul style="list-style-type: none"> <li>• Install pet waste stations in public areas;</li> <li>• Utilize Environmental Justice and or Disadvantaged Community funding;</li> <li>• Conduct feasibility studies for modifying drainage patterns in areas identified in the Lake Granbury WPP;</li> <li>• Conduct feasibility studies and engineering designs for altering canal systems in areas identified in the Lake Granbury WPP; and</li> <li>• Conduct feasibility studies and engineering designs for retention basins in areas specified in the Lake Granbury WPP.</li> </ul>
<b>Subtask 4.3:</b>	<p><b>Train EC Members to Find and Apply for Funding:</b> Throughout the duration of Task 4, the Watershed Coordinator will work closely with EC members to educate members on the process of finding funding and completing funding requests so that stakeholders will have the necessary skills to complete these tasks and continue with implementation after the conclusion of this grant.</p>
<b>Deliverables</b>	<ul style="list-style-type: none"> <li>• List of funding sources linked to each identified NPS management measure in the Lake Granbury WPP;</li> <li>• Assist EC members with completing two grant proposals per year for implementation of NPS management measures identified in the Lake Granbury WPP;</li> <li>• Task status update in QPR;</li> <li>• Draft Report summarizing activities conducted under the Resource Identification, Grant Writing, and Funding Requests Task; and</li> <li>• Final Report summarizing activities conducted under the Resource Identification, Grant Writing, and Funding Requests Task.</li> </ul>

Task	Objectives and Schedule (in Replicate or modify table as needed)
<b>Task 5:</b>	<b>Implementation of Education and Outreach Plan Recommended in the Lake Granbury WPP</b>
<b>Objective:</b>	<p>The Watershed Coordinator will facilitate implementation of the Lake Granbury WPP through outreach and education activities in the Lake Granbury watershed. Texas AgriLife Research, who will be employing the Watershed Coordinator, has existing educational programs for many of the areas requested by the stakeholders in the Lake Granbury WPP. However, AgriLife does not have existing programs for two of the stakeholder's requested topics. The Watershed Coordinator will develop educational programs and materials related to septic tank inspections during the home inspection process, and how to discourage feeding and the congregation of waterfowl and wildlife. TCEQ, BRA and AgriLife will work together to ensure existing materials developed for other projects are used appropriately and will not recreate existing materials. Additionally, the Watershed Coordinator will: 1) implement the educational program included by the stakeholders in the Lake Granbury WPP; 2) work to increase public awareness regarding water quality around Lake Granbury; 3) increase natural resource literacy among residents of Lake Granbury; 4) in cooperation with other Lake Granbury work groups, develop educational strategies to increase awareness of contaminant sources and BMPs to limit contaminants from reaching the lake; 5) increase awareness and community involvement in implementation of the Lake Granbury WPP; 6) establish a brand for the LGWPPSG; 7) develop partnerships for message distribution; 8) create micro-campaigns for specific target audiences; and 9) establish a practice of ongoing educational campaign evaluation</p>
<b>Subtask 5.1</b>	<p><b>Evaluate Watershed Knowledge and Awareness</b> -- The Watershed Coordinator will conduct a random survey of Hood County residents prior to beginning Task 5.6 to assess knowledge and awareness of the general public; then re-conduct the same survey towards the end of the project. This will allow for assessment of watershed-wide effectiveness rather than effectiveness on only the participants. The survey will be developed in accordance with all applicable federal restrictions and guidelines.</p>

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<b>Subtask 5.2</b>	<b>County Order</b> – The Watershed Coordinator, in cooperation with HCHD staff, will draft and present a County Order to the Hood County Commissioner’s Court requiring permit holders of sewage holding tanks in the 100-year floodplain in the community of Rolling Hills Shores to maintain and annually submit pump-out records to the HCHD. The submittal of these records will allow HCHD staff to identify holding tanks that are not being maintained in accordance with state and local regulations.
<b>Subtask 5.3</b>	<b>Outreach to Local Governments</b> – The Watershed Coordinator will conduct outreach to local elected officials, and city managers regarding the need for, and benefits of, local regulations recommended in the Lake Granbury WPP. In Addition, if local governments are receptive, assist local government staff in drafting orders and ordinances to prohibit wildlife and waterfowl feeding within one-mile of Lake Granbury.
<b>Subtask 5.4</b>	<b>Outreach to HOAs</b> – The Watershed Coordinator will conduct outreach to the HOAs in priority areas identified in the Lake Granbury WPP regarding the need for, and benefits of, consultation with, and approval of, the HCHD prior to approving construction permits for home additions. In addition, if HOAs are receptive, assist HOAs in drafting regulation to require consultation with, and approval of, HCHD prior to approving construction permits for home additions that rely on OSSFs for waste disposal.
<b>Subtask 5.5</b>	<b>Develop Educational Program and Materials for Home Inspectors on How to Properly Assess Septic Systems during Home Inspections and Discouraging the Feeding Waterfowl and Wildlife</b> - The Watershed Coordinator will develop an outreach program including a slide presentation, a one-page fact sheet for each topic, a brochure for each topic, and information for placement on both BRA’s website and the AgriLife website. To minimize costs, the Watershed Coordinator will use, where possible, materials already created by other NPS Pollution programs.

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<b>Subtask 5.6:</b>	<p><b>Implementation of Educational and Outreach Measures as Outlined in the Lake Granbury WPP –</b>  The Watershed Coordinator will implement the Outreach Campaign described in the Lake Granbury WPP by working closely with Stakeholders, BRA Staff, county extension agents, county Natural Resource Conservation Service (NRCS) agent, applicable state agency staff, local governments, and other interested groups. Education and outreach will be directed to targeted audiences to:</p> <ul style="list-style-type: none"> <li>o Inform them of the Outreach campaign to increase the awareness of targeted audiences identified below regarding water quality issues in Lake Granbury and BMPs available to address those issues;</li> <li>o Inform the targeted audiences of how water quality impairments/concerns impact them;</li> <li>o Provide a means for involvement and collaboration. Particularly, emphasizing what the targeted audiences can do to improve Lake Granbury and how they can help disseminate information on the Lake Granbury WPP; and</li> <li>o Encourage adoption of measures and resolutions to work towards improving the quality of water in Lake Granbury.</li> </ul> <p>Targeted audiences will include:</p> <ul style="list-style-type: none"> <li>• HOA's including, but not limited to: Port Ridglea East, Oak Trail Shores, Indian Harbor, Sky Harbor, and Rolling Hills Shores;</li> <li>• Septic System Service Providers;</li> <li>• Agricultural Producers including, but not limited to: Ranchers, and Wildlife Managers;</li> <li>• Small Acreage Landowners;</li> <li>• Home Inspectors;</li> <li>• Specialty Groups including, but not limited to: Master Naturalists Groups, and Master Gardeners Groups;</li> <li>• Sportsmen;</li> <li>• Ecotourism Groups including, but not limited to: Bird watching, Boating, Swimming, Marinas, Camping, and Bed and Breakfast;</li> <li>• Schools and museums;</li> <li>• Greenspace management: including, but not limited to: Landscapers, Golf course managers, and Parks and Recreation Staff; and</li> <li>• Civic organizations such as the Rotary and Lions Clubs, Junior League, Knights of Columbus.</li> </ul> <p>Topics to be covered include, but are not limited to, the following:</p> <ul style="list-style-type: none"> <li>• Septic System/Drain Field Operation and Maintenance</li> <li>• Graywater</li> <li>• Evaluating Service Contracts</li> <li>• Aerobic Treatment Units</li> <li>• Evapotranspiration Beds</li> <li>• Spray Distribution Systems</li> <li>• Practitioner Training</li> <li>• Home Inspector Training</li> <li>• Pet Waste Management</li> <li>• Urban BMPs</li> <li>• Urban Stormwater</li> <li>• Feral Hog Control</li> <li>• Improving Water Quality on Grazing Lands</li> <li>• Agricultural BMPs</li> </ul>
<b>Subtask 5.7:</b>	<p><b>Track Implementation of Education and Outreach Management Measures as Outlined in the Lake Granbury WPP –</b> The Watershed Coordinator will produce a quarterly summary table of education and outreach activities including: area/group/event served, date of service, number of people reached, and topics covered. The quarterly summary table will be submitted to TCEQ with the OPRs.</p>
<b>Subtask 5.8:</b>	<p><b>Evaluate Targeted Outreach Campaign Effectiveness –</b> The Watershed Coordinator will create an evaluation instrument for presentors to circulate at select events to assess the effectiveness of their tools, outreach and presentations. The Watershed Coordinator will develop a survey instrument to circulate annually to the LGWPPSG to assess their satisfaction with the campaign and to solicit inputs for improvements. The Watershed Coordinator will develop a database of attendees of outreach events and will survey those attendees six months after the event to determine whether attendees modified their lifestyle as a result of the information provided during the event. The Outreach Campaign will be continually evaluated and suggestions from stakeholders and attendees will be incorporated to make the campaign more effective.</p>

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<b>Subtask 5.9:</b>	<b>Publicize Lake Granbury WPP Efforts</b> – The Watershed Coordinator will develop quarterly press releases regarding educational opportunities and distribute to local media personnel. The Watershed Coordinator will work with local radio and/or TV stations to air public service announcements/programs about the Lake Granbury WPP efforts, and/or water quality and watershed management.
<b>Deliverables:</b>	<ul style="list-style-type: none"> <li>• Draft County Order requiring submission of maintenance of pump-out records to HCHD for holding tanks in the 100-year floodplain;</li> <li>• If receptive, draft County Order and City Ordinances regarding prohibition on feeding wildlife within 1 mile of Lake Granbury;</li> <li>• If receptive, draft HOA Regulations requiring consultation with HCHD prior to obtaining approval to expand existing structures with septic and/or holding tanks;</li> <li>• Outreach materials for septic tank inspection and wildlife/waterfowl educational programs;</li> <li>• Conduct at least two presentations per month to different target audiences;</li> <li>• Conduct at least one presentation per quarter to "other audiences" listed in Task 5.6;</li> <li>• Quarterly summary table of outreach activities included with QPR;</li> <li>• Quarterly press releases included with QPR;</li> <li>• One public service announcement/programs aired per quarter on local radio and/or TV;</li> <li>• A Draft Education and Outreach Task Report; and</li> <li>• A Final Education and Outreach Task Report.</li> </ul>

Tasks, Objectives, and Deliverables (Applicable to monthly and/or quarterly)	
<b>Task 6:</b>	<b>Final Project Report</b>
<b>Objective:</b>	To produce a Final Report that summarizes all project activities completed and conclusions reached, and that contains all the reports completed under previous tasks either in the text or as appendices.
<b>Subtask 6.1:</b>	<b>Draft Report</b> – BRA will provide a draft report summarizing all project activities, findings, and the contents of all previous deliverables, referencing and/or attaching them as web links or appendices. This comprehensive, technical report will provide analysis of all activities and deliverables under these Grant Activities. The report will include the following information: <ul style="list-style-type: none"> <li>• Title;</li> <li>• Table of Contents;</li> <li>• Executive Summary;</li> <li>• Introduction;</li> <li>• Project Significance and Background;</li> <li>• Methods;</li> <li>• Results and Observations;</li> <li>• Discussion;</li> <li>• Summary;</li> <li>• References; and</li> <li>• Appendices.</li> </ul>
<b>Subtask 6.2:</b>	<b>Final Report</b> – BRA will revise the draft report to address comments provided by the TCEQ Project Manager. The final report will be submitted to the TCEQ Project Manager and subsequently to EPA.
<b>Deliverables:</b>	<ul style="list-style-type: none"> <li>• Draft Report; and</li> <li>• Final Report.</li> </ul>

**Summary of Goals (Applicable to NPS Stream WPP)**

Successful implementation of the Lake Granbury WPP relies on active engagement of local stakeholders, but will also require support and assistance from a variety of other sources. The technical expertise, equipment, and manpower required for many management measures are beyond the capacity of the LGWPPSGs alone. As a result, direct support from one or a combination of several entities will be essential to achieve water quality goals in the watershed. Focused and continued implementation of key management measures will require the creation of the Watershed Coordinator position in the watershed to coordinate and provide technical assistance to stakeholders.

TCEQ, BRA, AgriLife and the members of the LGWPPSG are working together to fund the position of Watershed Coordinator for the Lake Granbury Watershed. This is necessary as there is a need to: assist and track implementation of the Lake Granbury WPP, assess effectiveness of the Lake Granbury WPP in improving water quality, continue facilitation of the LGWPPSG, provide necessary outreach and education, and seek funding opportunities to ensure implementation of the Lake Granbury WPP.

This project will: 1) fund a Watershed Coordinator; 2) facilitate, coordinate and track implementation of NPS management measures described in the Lake Granbury WPP; 3) continue to identify additional feasible measures for reducing pollutant loading the reservoir; 4) coordinate efforts with Federal, State, regional and local agencies; 5) identify and seek additional funding to continue watershed protection efforts in the Lake Granbury watershed; 6) link partners/stakeholders and projects to available funding sources; 7) sponsor

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local workshops with State, local, and regional agencies and organizations; and 8) publicize and build awareness of the watershed improvement efforts and bolster local support and participation in these efforts.

Facilitation, coordination and management of the LGWPPSG and implementation of the Lake Granbury WPP will entail a substantial commitment of time and resources. The Watershed Coordinator will provide a single-point of contact for activities, facilitate information exchange among participants, and, ultimately, ensure implementation of the Lake Granbury WPP. The Watershed Coordinator will also monitor and report on load reductions based on implementation of NPS management measures identified in the Lake Granbury WPP. The Watershed Coordinator will assist stakeholders with locating funding and writing grant applications to acquire resources for use by the LGWPPSG members to implement the Lake Granbury WPP. The Watershed Coordinator will convene annual meetings to update stakeholders on progress, and will revise the plan every five years, if necessary. The Watershed Coordinator will also assist local governments and HOA's in researching and drafting orders, ordinances, and regulations as recommended in the Lake Granbury WPP. The Watershed Coordinator will implement the educational program included by the LGWPPSG.

The work specified in project Grant Activities will be documented through meeting summaries, QPRs, and a final report describing implementation of the Lake Granbury WPP.

1. Adherence to TCEQ's administrative requirements; completion and submittal of progress reports and deliverables;
2. A completed Contract with AgriLife for a Watershed Coordinator;
3. Continued LGWPPSG facilitation and activity through completion of annual stakeholder meetings and by providing updates to Stakeholders to keep them active and invested in implementation of recommended management measures in the Lake Granbury WPP;
4. Continued Lake Granbury WPP implementation through coordination with the EC on a monthly basis;
5. Clear guidance to stakeholders on potential funding opportunities based on each NPS management measure in the Lake Granbury WPP.
6. Completion and submission of a minimum of two grant applications for funding of NPS management measures by Stakeholders;
7. Drafts of local legislation by local governments for legislation recommended in the Lake Granbury WPP. This will include draft orders for Hood County and draft ordinances for the City of Granbury and the City for DeCordova Bend;
8. Draft of revised HOA rules for three HOAs to reduce OSSF overload through property expansion/renovation by requiring consultation with the HCHD prior to the HOA approving construction permits;
9. Development of educational program and supporting materials to address pet waste management, and feeding and encouraging the congregation of waterfowl and wildlife;
10. Conduction of a total of fifty educational presentations to target audiences;
11. Conduction of a total of ten educational presentations to non-target audiences;
12. Development of methodology to evaluate outreach campaign effectiveness;
13. Development of ten (one per quarter) press releases regarding the Lake Granbury WPP, management measure implementation and progress of the Education Plan; and
14. Development of ten (one per quarter) public service announcements to be aired on local radio and/or television stations.

While some of the less complex management measures recommended here will be relatively simple to implement early in the process, full implementation of the management measures will require more time, energy and funding. For this reason, reductions in pollutant loads and concentrations initially may be gradual since reductions are assumed to be tied to the implementation of management measures throughout the watershed. The largest reductions in bacteria loading will be observed from implementation of the construction-based measures.

While literature or studies are not available to translate educational effectiveness to load reduction effectiveness, it is anticipated that educational programs will provide load reductions in two ways: (1) through actual load reductions realized through increased efforts to repair and maintain OSSF systems, and (2) through increased awareness and participation in associated strategies that manage and reduce bacteria loading (e.g., pet waste or livestock manure management programs).

Surveys conducted in prior studies indicate that most homeowners in the Lake Granbury area do not perform regular maintenance on their systems (BRA 1995)<sup>1</sup>. This was also found during studies conducted as part of the Lake Granbury WPP; additionally, some individual homeowners participating in Lake Granbury WPP surveys and on-site studies discovered and remedied significant problems representing major bacteria load reductions affecting their entire area. Since the Lake Granbury water quality models utilized in the Lake Granbury WPP indicate that some canal systems can be negatively impacted by just one poorly functioning system, any improvement in the rate of system maintenance will lead to reduced loadings. If homeowners begin to properly maintain their septic systems as a result of educational efforts, a great reduction in bacteria loading could be observed on a very local basis. The effect of OSSF education has already been observed in the Oak Trail Shore (OTS) community. The OTS HOA has been working with AgriLife to educate homeowners about the value of OSSF maintenance. In the six month period since, one homeowner performed maintenance; interim monitoring has documented significant improvement *E. coli* concentrations in the adjacent canal.

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The water quality models used in the Lake Granbury WPP indicate that individual homeowners, who because of the education discover major problems and repair their system, have the potential to reduce their individual household's bacteria loading to receiving waters by more than 90%.

Education effectiveness will be assessed throughout the Education Program. Evaluation instruments will be circulated before and after select events to assess the effectiveness of tools, outreach and presentations in convincing participants to make lifestyle changes that will benefit the watershed. Additionally, a survey instrument will be circulated annually to the LGWPPSG to assess their satisfaction with the campaign and to solicit inputs for improvements. A database of attendees of outreach events will be developed and those attendees will be surveyed six months after the event to determine whether attendees modified their lifestyle as a result of the information provided during the event. The Outreach Campaign will be continually evaluated and suggestions from stakeholders and attendees will be incorporated to make the campaign more effective.

There are limitations to predicting load reductions based on the success of the implementation of the Education Program in convincing watershed residents to alter their behavior to benefit water quality. However, with the evaluation instruments to be developed during this project and follow-up surveys, it will be possible to determine the percent of individuals who adjusted behaviors based on outreach activities and to calculate an estimated load reduction based on these figures.

All stakeholders are in strong support of educational initiatives. While stakeholders do anticipate load reductions based upon studies showing the effectiveness of related educational programs in changing public practices (e.g., Texas Agricultural Experiment Station (TAES) 2009), their expectation of the magnitude of load reduction is realistic in that anticipated education-based reductions are not as high as those anticipated from structural measures. Stakeholders do not expect that education will identify all existing problem systems, particularly considering many systems in the area are aging and will continue to develop and exhibit problems through time. Despite this, the stakeholders welcome and strongly support, any localized improvements that education can gain in the near-term since they understand the long-term scope of development for many of the construction-based management measures.

<sup>1</sup> [BRA] BRA, 1995, *Survey of Conditions and Impact of Septic Tank Pollution on the Water Quality in Lake Granbury*.

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**BRA - Lake Granbury Watershed Protection Plan Project  
Schedule of Deliverables**

Schedule of Deliverables Based on Anticipated Project Funding/Initiation Date

<b>Task No.</b>	<b>Deliverable</b>	<b>Due Date</b>
1.1	Project oversight status	With QPR's
1.2	QPRs	The 15 <sup>th</sup> of the month following each state fiscal quarter
1.3	Quarterly Reimbursement Request Forms	The last day of the month following each state fiscal quarter; for the last reporting period of the project, reimbursement forms are required on a monthly basis.
1.4	Post Award Meeting	Within 30 days of contract execution
1.4	Post Award Meeting Minutes	Within 15 days of Post Award Meeting
1.4	Quarterly conference call or meeting with the TCEQ Project Manager & Minutes	Quarterly
1.5	Project Annual Report Article	Upon request by TCEQ
2.1	QAPP Planning Meeting	Within 3 months of contract execution
2.2	Draft QAPP for Monitoring submitted to TCEQ	Within 4 months of contract execution
2.2	Final QAPP for Monitoring submitted to TCEQ	Within 6 months of contract execution
2.3	Water quality monitoring non-conformances will be reported	As soon as possible and with QPRs
2.4	Draft QAPP Updates submitted to TCEQ Annually	60 days prior to the end of the effective period of the QAPP
2.4	Final QAPP Updates submitted to TCEQ Annually	45 days prior to the end of the effective period of the QAPP
2.5	Draft QAPP Amendments	75 days prior to change in sampling plan implemented
2.5	Final QAPP Amendments	45 days prior to change in sampling plan implemented
2.6	Data Submittals	Quarterly and at least 1 month prior to use, or prior to presenting to stakeholders
3.1	EC Meetings	Monthly
3.1	LGWPPSG Meetings	Bi-Annually
3.2	Update the Lake Granbury WPP Webpage with meeting agendas, presentations and other meeting materials	Within 2 Weeks of Meetings

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<b>3-3</b>	E-mail Newsletter	Bi-Monthly
<b>3-4</b>	Stakeholder Recognition	Bi-Monthly with Newsletter
<b>3-5</b>	Updated Stakeholder List and General Public Notification List	Bi-Annually
<b>3-6</b>	Summary table of NPS management measures status	Annually
<b>3-6</b>	Summary table of grant application status	Quarterly with QPRs
<b>3-6</b>	Report on LGWPPSG and EC Facilitation	With Final Project Report
<b>4-1</b>	List of Funding Sources	Within 12 months of contract execution
<b>4-2</b>	Complete Grant Proposals	2 per Year
<b>4-3</b>	Train Stakeholders to Find and Apply for Funding	Ongoing
<b>4-3</b>	Report on Resource Identification, Grant Writing, and Funding Requests	With Final Project Report
<b>5-1</b>	Survey of Hood County Residents on Watershed Knowledge and Awareness	Within 12 months of contract execution
<b>5-2</b>	Draft County Order regarding sewage holding tanks in the 100-year floodplain	Within 9 months of contract execution
<b>5-3</b>	Draft County Order and City Ordinances regarding feeding wildlife/waterfowl around Lake Granbury	Within 9 months of contract *
<b>5-4</b>	Draft HOA regulation regarding consultation with HCHD prior to expanding structures with septic and holding tanks	Within 18 months of contract execution *
<b>5-5</b>	Outreach materials for septic tank inspection and wildlife/waterfowl educational programs	Within 6 months of contract execution
<b>5-6</b>	Conduct Outreach Presentations to Different Target Audiences	2 per month
<b>5-6</b>	Conduct Outreach Presentations to "Other Audiences"	1 per quarter
<b>5-7</b>	Summary Table of Education and Outreach Activities	Quarterly with QPR's
<b>5-8</b>	Event Evaluation Instrument and Results	With Final Project Report

Grantee: BRA

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<b>5.8</b>	LGWPPSG Survey Instrument and Results	With Final Project Report
<b>5.8</b>	Outreach Attendees Database, Survey, and Survey Results	With Final Project Report
<b>5.9</b>	Press Releases Regarding Educational Opportunities	Quarterly with QPR's
<b>5.9</b>	Air Public Service Announcements	1 per quarter
<b>5.9</b>	Report on Education and Outreach Task	With Final Project Report
<b>6.1</b>	Draft Final Project Report	Within 34 months of contract execution
<b>6.2</b>	Final Project Report	Within 36 months of contract execution

\*Notes: Deliverable is dependent upon the City, County, and/or HOAs being receptive to participating in the development of the deliverable. If they are not, the deliverable will not be produced.

## **Appendix C: Monitoring Stations Map**



**Appendix D: Incident Spreadsheet**



**Appendix E: Corrective Action Plan Form**

Brazos River Authority Corrective Action Report (CAR)

CAR #	Incident #	Date initiated:
Analyst:	Test:	Runs affected:
Samples numbers affected:	Site numbers affected:	Number of samples lost:
Type of deficiency: (column O)	Root cause:	
describe what happened (column E)		
Corrective action: (column H)		Suggested timeline:

Lab Manager/Technical Director Review

DQAO Review

Initials	Date	Initials	Date
Returned to analyst Y/N (date)	Comments: (reason for return)	Returned to analyst Y/N (date)	Comments: (reason for return)
Final review date:		Final review date:	

BRA Project Manager

Initials		Date
Project impact	Resample Y / N	Contact TCEQ Y / N
Returned to lab Y / N	Comments: (reason for return)	Final review date:

Quality Review

Initials/title	Date	Returned to LM/TD Y /N	LM/TD Comments:
Was corrective action effective? Y/N (If N, explain)		Comments: (reason for return)	

## ATTACHMENT 1 Example Letter to Document Adherence to the QAPP

TO: (name)  
(organization)

FROM: Kay Barnes  
Brazos River Authority

RE: Brazos River Authority, Granbury Watershed Protection Plan Quality Assurance Project Plan

Please sign and return this form by (date) to:

(address)

I acknowledge receipt of the "Granbury Watershed Protection Plan QAPP". I understand that the document describes quality assurance, quality control, data management and reporting, and other technical activities that must be implemented to ensure the results of work performed will satisfy stated performance criteria.

My signature on this document signifies that I have read and approved the document contents. Furthermore, I will ensure that all staff members participating in activities covered under this QAPP will be required to familiarize themselves with the document contents and adhere to the contents as well.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

*Copies of the signed forms should be sent by the Contractor to the TCEQ NPS Project Manager within 60 days of TCEQ approval of the QAPP.*