

Jon Niermann, *Chairman*  
Emily Lindley, *Commissioner*  
Bobby Janecka, *Commissioner*  
Toby Baker, *Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

November 7, 2019

Ahmed Mahmoud, Ph.D.  
The University of Texas Rio Grande Valley  
1201 West University Drive  
Edinburg, TX 78539

Re: Approval: Characterization of Northern and Central Lower Rio Grande Valley  
Watersheds Geospatial Quality Assurance Project Plan (QAPP)

Federal Grant Number: 99614623

Dear Dr. Mahmoud:

The above-referenced QAPP was approved today, November 7, 2019. A pdf version of the QAPP and approval letter will be sent to your e-mail address.

Please ensure the QAPP and any subsequent amendments are distributed in a timely manner to the appropriate entities listed in Section A3 of the QAPP. This approval letter must be available for review during a quality system audit.

Should you have questions, feel free to contact me at (512-239-6340) or at [sharon.coleman@tceq.texas.gov](mailto:sharon.coleman@tceq.texas.gov).

Sincerely,

A handwritten signature in blue ink that reads "Sharon R. Coleman".

Sharon R. Coleman  
TCEQ Quality Assurance Manager and Acting Lead Nonpoint Source (NPS) Program Quality Assurance Specialist

Enclosure

Cc: Tim Cawthon, TCEQ NPS Project Manager, MC-203

Characterization of Northern and Central Lower Rio Grande Valley Watersheds  
Geospatial Quality Assurance Project Plan (QAPP)

The University of Texas Rio Grande Valley (UTRGV)  
Edinburg, Texas 78539

Funding Source:

Nonpoint Source (NPS) Program CWA §319(h)  
Prepared in cooperation with the  
Texas Commission on Environmental Quality and  
the U.S. Environmental Protection Agency  
Federal ID # 99614623  
QTRAK# \_\_\_\_\_

Effective Period: Three years from date of final approval

Questions concerning this QAPP should be directed to:

Ahmed Mahmoud, Ph.D.  
Project Manager  
1201 West University Drive  
Edinburg TX 78539  
956-331-9847  
[ahmed.mahmoud@utrgv.edu](mailto:ahmed.mahmoud@utrgv.edu)

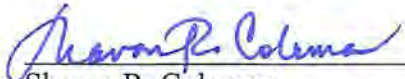
## A1 APPROVAL PAGE

By signing this document, signatories acknowledge their respective organizations' awareness of and adherence to requirements contained in this QAPP in accordance with roles and responsibilities as described in Section A4 Project/Task Organization and throughout.

### TEXAS COMMISSION ON ENVIRONMENTAL QUALITY


#### Monitoring Division

Laboratory and Quality Assurance (QA) Section



Sharon R. Coleman  
TCEQ QA Manager

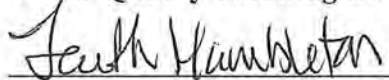
11/7/2019  
Date



Sharon R. Coleman  
Acting Lead NPS QA Specialist  
Quality Assurance Team

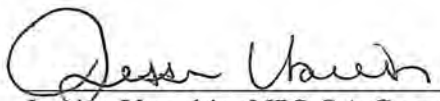
11/7/2019  
Date

#### Water Quality Planning Division



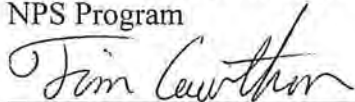
Faith Hambleton, Team Leader  
Nonpoint Source (NPS) Program

11/6/19  
Date



Jessica Uramkin, NPS QA Coordinator  
NPS Program

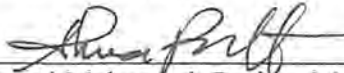
11/5/19  
Date




Tim Cawthon, NPS Project Manager  
NPS Program

11/4/19  
Date

**The University of Texas Rio Grande Valley**

  
Ahmed Mahmoud, Project Manager 11/04/19  
Date

  
Abdoul Ouedraogo, Ph.D., QAO/Data Manager 11/04/2019  
Date

UTRGV will secure written documentation from additional project participants stating the organization's awareness of and commitment to requirements contained in this QAPP and any amendments or revisions of this plan. UTRGV 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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AU	Assessment Unit
BSEACD	Barton Springs Edwards Aquifer Conservation District
CAR	Corrective Action Report (CAR)
CWA	Clean Water Act
DO	Dissolved Oxygen
ECHO	Environmental Compliance History Online
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
HCDD	Hidalgo County Drainage District
IBWC	International Boundary and Water Commission
LRGV	Lower Rio Grande Valley
MS4	Municipal Separate Storm Sewer Systems
NCEI	National Centers for Environmental Information
NHD	National Hydrography Dataset
NHD	National Hydrology Dataset
NLCD	National Land Change Database
NOAA	National Oceanic and Atmospheric Administration
NPS	Non-Point Source
NRCS	Natural Resources Conservation Service
OSSF	On-Site Sewage Facility
QA	Quality Assurance
SELECT	Spatial Explicit Load Enrichment Calculation Tool
SOP	standard operating procedures
SSO	Sanitary Sewer Overflows
SSURGO	Soil Survey Geographic Database
TAMUK	Texas A&M University-Kingsville
TIGER	Topologically Integrated Geographic Encoding and Referencing database
TMDL	Total Maximum Daily Load
TNRIS	Texas Natural Resources Information System
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
TSDN	Technical Support Data Notebook
TSS	Total Suspended Solids
TWDB	Texas Water Development Board
TWRI	Texas Water Research Institute
TxDOT	Texas Department of Transportation
USDA	US Department of Agriculture
USGS	United States Geological Survey
UTRGV	University of Texas Rio Grande Valley
WPP	Watershed Protection Plan

WQMP      Water Quality Management Plans  
WWTP      Waste Water Treatment Plant

### **A3 DISTRIBUTION LIST**

The Acting Lead NPS QA Specialist will provide approved versions of this QAPP and any amendments or revisions to the TCEQ NPS Project Manager. The TCEQ NPS Project Manager will provide approved copies to the UTRGV Project Manager and EPA Project Officer within two weeks of approval. The TCEQ NPS Project Manager will document transmittal of the plan and maintain this documentation as part of the project's quality assurance records. This documentation will be available for review in the event of an audit.

Anthony Suttice, Project Officer  
EPA Region 6  
(214) 665-8590

The UTRGV 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 UTRGV 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 in the event of an audit.

#### **The University of Texas Rio Grande Valley**

Ahmed Mahmoud, Ph.D., Project Manager  
1201 West University Drive  
Edinburg TX 78539  
956-331-9847  
Ahmed.mahmoud@utrgv.edu

Abdoul Oubeidillah, Ph.D., Quality Assurance Officer/ Data Manager  
1201 West University Drive  
Edinburg TX 78539  
abdoul.oubeidillah@utrgv.edu

## **A4 PROJECT/TASK ORGANIZATION**

### **TCEQ**

#### **Monitoring Division**

##### **Sharon R. Coleman**

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

Assists the TCEQ NPS Project Manager in QA related issues. 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. Provides technical expertise and/or consultation on quality services. 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**

##### **Faith Hambleton, 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, program corrective actions, work plans, and contracts. Enforces program corrective action, as required. Ensures NPS personnel are fully trained and adequately staffed.

##### **Tim Cawthon 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. Provides contractor with most recent version of QAPP shell document. Participates in the development, approval, implementation, and maintenance of the QAPP. Conducts independent technical review of the QAPP to ensure compliance with project needs and requirements. Responsible for verifying that the approved QAPP is implemented by the contractor. Notifies the TCEQ Lead NPS QA Specialist of particular circumstances which may adversely affect the quality of data derived from the collection and analysis of samples. Monitors and enforces corrective action.

##### **Jessica Uramkin**

**NPS Quality Assurance Coordinator**

Assists Lead NPS QA Specialist with NPS QA management. Serves as liaison between NPS management and Agency QA management. Responsible for NPS guidance development related to program quality assurance. Assists with development and maintenance of data management-related standard operating procedures (SOP) for NPS data management. Participates in the development, approval, implementation, and maintenance of the QAPP. Provides input and oversight regarding corrective actions. Maintains record of corrective actions.

**Ahmed Mahmoud, Ph.D.**

**UTRGV 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 data collection activities. Complies with corrective action requirements.

**Abdoul Oubeidillah, Ph.D.**

**UTRGV QAO and Data Manager**

Responsible for coordinating development and implementation of the QA program. Responsible for ensuring the most recent version of the NPS QAPP shell document is acquired from the TCEQ NPS Project Manager and used 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 NPS Project Manager to resolve QA- related issues. Notifies the UTRGV Project Manager and TCEQ NPS Project Manager of and documents particular circumstances which may adversely affect the quality of data. Responsible for validation and verification of all data modeled, collected and acquired. Coordinates the research and review of technical QA material and data related to water quality monitoring system design and analytical techniques. Facilitates, conducts, and documents any technical systems audits.

The Project Data Manager is responsible for acquisition, verification, and analysis of secondary data, documentation of acquired data sources, ensuring the accuracy of data, and for the transfer of acquired data to the TCEQ as deemed necessary by TCEQ Project Manager. Oversees data management for the QAPP. Responsible for maintaining project quality assurance records. Oversees data management for the study. Provides the point of contact for the TCEQ Data Manager to resolve issues related to the data.

**U.S. EPA Region 6**

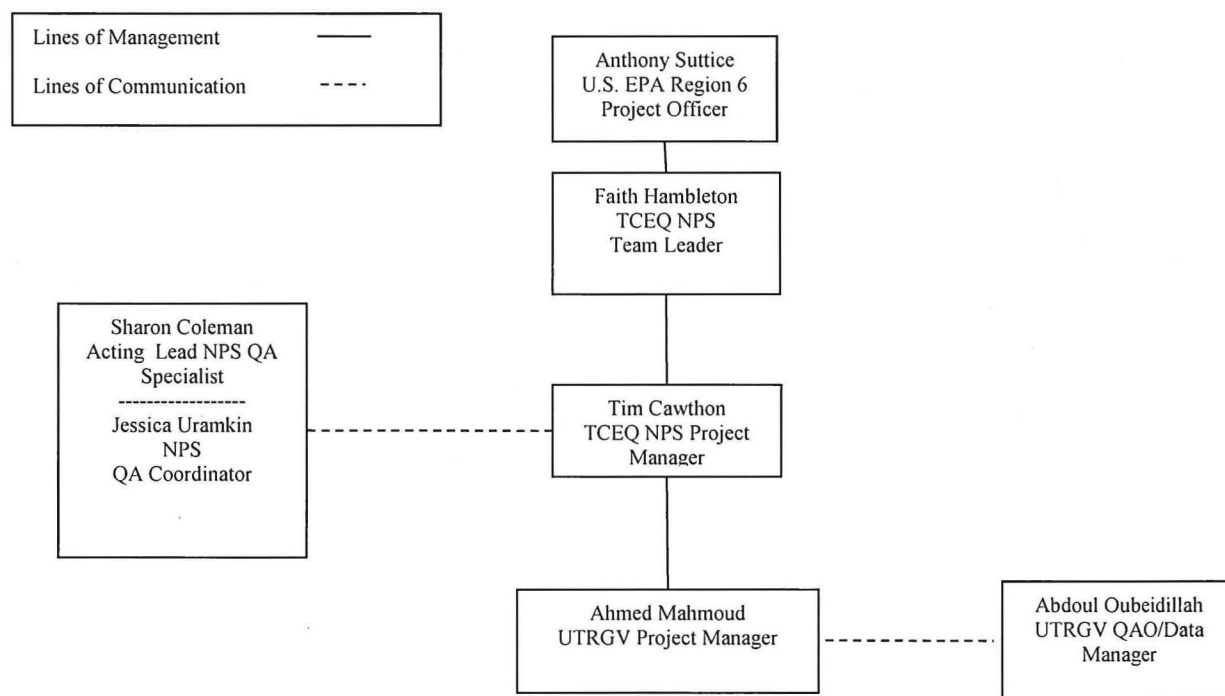
**Anthony Suttice**

**EPA Project Officer**



Responsible for managing the CWA Section 319 funded grant on behalf of 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 work plans, draft deliverables, and works with the State in making these items approvable. Meets with the State at least annually to evaluate the progress of each project and, when conditions permit, participates in project site visits. 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 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

The Northern and Central Lower Rio Grande Valley (LRGV) watersheds are north of the Arroyo Colorado watershed in Hidalgo, Cameron, and Willacy counties. The watersheds include several TCEQ segments: North Floodway (2494B\_01), Hidalgo Main Floodwater Channel (2491C\_03), Raymondville Drain (2491C\_01), Willacy Main Drain (2491C\_02), and remaining perennial freshwater drainage ditches flowing into main drains (2491C\_04). The Raymondville Drain and the Hidalgo Main flow into the Lower Laguna Madre Bay assessment unit (AU) 2491\_01 which is impaired for low dissolved oxygen (DO). The North Floodway flows into the Lower Laguna Madre AU 2491\_02 which is impaired for low DO and bacteria. The North Floodway has concerns for bacteria, nitrate, and *chlorophyll-a* according to Draft 2018 Texas Integrated Report. Water quality monitoring of the Hidalgo Main and Raymondville Drains began in 2018.

The project area is comprised of subwatersheds associated with the Raymondville Drain, the Hidalgo Floodway, and the IBWC pilot channel (IBWC North Floodway). These major waterways contribute freshwater and stormwater to the Laguna Madre. This project will begin the assessment of these subwatersheds. It is anticipated that these three distinct subwatersheds will need to be assessed, quantified, and identified as separate major watersheds in the Lower Rio Grande Valley.

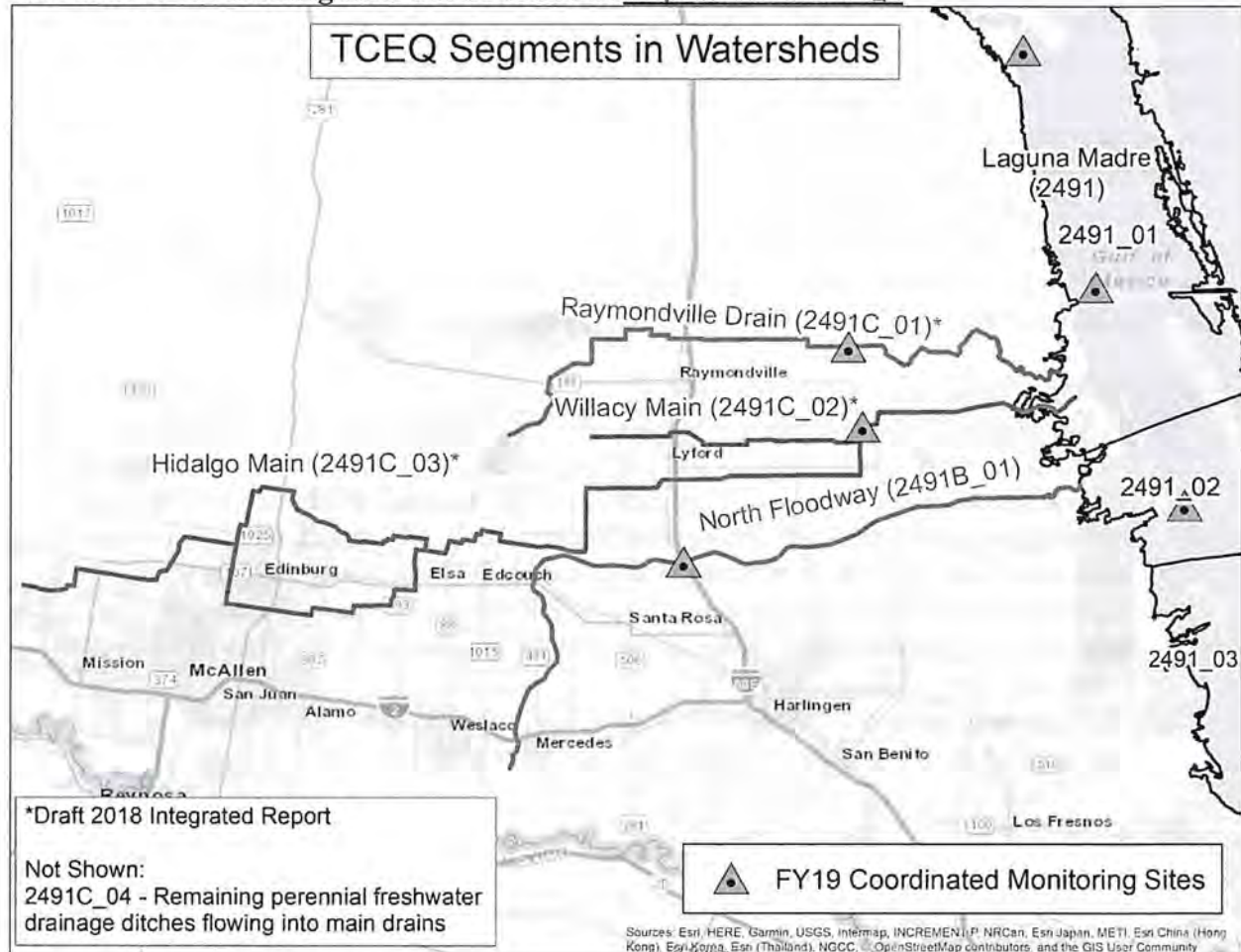
The Raymondville Drain collects stormwater runoff and return flows from the subwatershed with predominant agriculture activity. The North Floodway pilot channel constantly drains WWTP effluent and during large storm events, collect excess runoff from urbanized areas of Hidalgo County and agriculture land in Cameron and Willacy County. The Hidalgo Main Drain carries urban stormwater runoff from central and northern Hidalgo County, and agricultural runoff from northeast Hidalgo County and Willacy County. The hydrology on the east end of these three watersheds has been severely impacted in recent years due to the expansion of the wind power farms; the access roads to the turbines have changed the runoff patterns in east Willacy County (based on anecdotal information).

There is a lack of water quality data collection within the target region and limited data has been collected to assess the project watershed(s) impairments and concerns or determine the contributing sources. The watershed has not been characterized and stakeholders are unaware of the concerns and impairments. Stakeholders need to be educated on the potential causes of the impairments to assist in determining goals and objectives for reducing pollutants in their watershed. Part of raising awareness is to provide watershed characterization information including geographic boundaries and available water quality data. Identification of existing data will take place to provide to stakeholders so that future planning and implementation activities can take place.

Stakeholders also need to be engaged to determine what existing data is available and to define the goals and objectives of potential future watershed-based plans. Through the stakeholder

engagement process, as well as a series of public meetings to solicit public input, a course of action for addressing potential pollutant loads can be determined.

**Figure A5.1. Map of TCEQ defined segments and coordinated monitoring sites flowing into the Lower Laguna Madre assessment units 2491\_01 and 2491\_02. More information on coordinated monitoring sites can be found at <https://cms.lcra.org/>.**



## A6 PROJECT/TASK DESCRIPTION AND SCHEDULE

In an effort to address the concerns and impairments of the Lower Laguna Madre (2491) assessment units 01 and 02, the watersheds of the Raymondville Drain, the Hidalgo Floodway, and the IBWC Floodway must be characterized to identify potential causes and sources. This project will identify existing data and identify data gaps for characterization as well as identify a path forward by selecting an analytical method for estimating pollutant loads. This project will also engage, educate, and solicit input from stakeholders on the goals, objectives, and indicators for addressing the impairments and concerns. Ultimately, it is the goal of this project to partially



accomplish Element A and initiate Element E of EPA's nine elements for watershed-based plans found in the Handbook for Developing Watershed Plans to Restore and Protect our Waters. This project will start the watershed characterization by acquiring existing data from various sources, identifying potential causes of water quality impairments and issues, identifying potential sources of pollution and relative contribution, and completing an inventory of data. Through the IBWC, Hidalgo County Drainage District No. 1 and the Willacy County Drainage District, UTRGV will gather all the flow and water quality data that these agencies have collected over the years. This data will be analyzed, categorized and evaluated (based on reliability and accuracy) to identify information that can be used to assess current conditions. A conceptual model will be developed to show the linkage between the water quality problems and sources of impairments. This analysis, to the extent possible, will include a spatial and temporal exploration of water quality problems and sources of pollution in the watershed. Identification and analysis of existing data will assist in determining data gaps and what data needs to be collected in the future. Additionally, the existing data and new data will drive the selection of the analytical method that will be used for estimating pollutant loads.

Specific Tasks to be accomplished include:

- 1) **Delineation of Subwatersheds** – The 3 watersheds will be split into subwatersheds for visualization of drainage patterns and potential future modeling effort (no modeling will be conducted under this project). Delineation of the subwatersheds will include LIDAR data analysis, individual city drainage delineations (e.g. Edinburg), local knowledge, and other sources as needed. A Watershed Delineation Documentation document will be developed documenting the process of how subwatersheds were delineated and areas that need future refinements (e.g. more on the ground studies). FGDC metadata will be developed for the GIS layer.
- 2) **Map Development** - Development of maps for inclusion in the Watershed Characterization Report and for presentation to stakeholders. Maps will include subwatersheds layer to visually show stakeholders drainage patterns and potential sources within those subwatersheds.
- 3) **USGS NHD Markup Application** – At the end of the project, UTRGV will suggest edits to the National Hydrography dataset using local information gathered during the course of the project. More information on the application is found here.  
<https://www.usgs.gov/core-science-systems/ngp/national-hydrography/tools#Markup>
- 4) **Flow and Water Quality Graphs** – UTRGV will gather all water quality and flow related data within the watersheds and conduct exploratory data analysis. Graphs and results will be presented to stakeholders and incorporated into the Watershed Characterization Report.
- 5) **Cyberinfrastructure and Database** – A regional database will be established and a web user interface developed. This database will incorporate local data received by Texas A&M University at Kingsville for the Arroyo Colorado watershed.

The main goal of the project is to collect and analyze data for the characterization of the three watersheds USIBWC North floodway, Hidalgo/Willacy Main Drain, and Raymondville Drain. This goal will be achieved through compiling geospatial and non-geospatial data for each watershed from various sources. UTRGV team will use the geospatial data to develop several maps and form a GIS database of each parameter to understand the predominant landscaping of each area contributing in the watershed. The non-geospatial data will be collected to assess the flow and water quality status and studying the different sources that affect the water flow to each floodway. By developing a database for each watershed, it can be used for further identification and future quantification of different potential pollutant sources which is a part of the WPP development. Activities in this project will create, coordinate, and facilitate a local stakeholder group that will determine the goals, objectives, and indicators for addressing the water quality impairments and concerns within the Raymondville Drain, the Hidalgo Floodway, and the IBWC Floodway watershed. Education programs will be delivered to the stakeholder group so they can understand what contributes to bacteria impairments, as well as, the parameters of concern in the project area and ways that they can be mitigated. Stakeholders will be engaged in developing the three WPPs for each watershed so that management measures are cost-effective, holistic, and supported at the local level.

To assist in helping stakeholders make decisions within their watershed, UTRGV will acquire, compile, and evaluate all existing relevant data, historical information, engineering studies, and other related information from State agencies, regional TMDLs, USIBWC, Hidalgo, Willacy and Cameron Counties; and all the cities within the boundaries of the watersheds for use in watershed characterization, stakeholder education and WPP development. UTRGV will coordinate project partners' ongoing data collection to support the development of the WPP, work to address any gaps in existing water quality data and to determine specific impacts of stormwater on areas with notable pollution. Information on acquired data is addressed in Element B9 of this document. Data analyses and maps of the project area, including sampling stations will be provided in the project final report.

UTRGV, in collaboration with other project partners, will work to compile, assess, and quality assure any existing, updated, or new data, information, and reports that may be used in characterizing the watershed, determining current and future levels and sources of pollution, and identifying management needs. UTRGV and project partners will assess existing water quality data and current monitoring efforts to determine if available data allows for comprehensive determination of sources and quantities of pollution.

If additional routine or stormwater sampling is required, UTRGV will conduct sampling site reconnaissance at prospective sample sites to determine the suitability. Once site selection has been finalized, UTRGV will coordinate with the Willacy, Hidalgo, Cameron Counties and other partners to conduct monitoring. These monitoring efforts, if required, will be performed in accordance with partner QAPPs or quality assurance protocols and will not utilize federal Clean Water Act Section 319 grant funds.

UTRGV will submit data reports and presentations for review and approval at least two weeks prior to any scheduled public release.

Mapping and modeling efforts to predict future watershed conditions will not be covered under this QAPP. A separate Mapping and Modeling QAPP will be developed for estimating, mapping, and modeling future development/watershed conditions and associated water quality impacts using future development scenarios.

Some map data may not be available in GIS format. To convert the map information to a digital GIS layer UTRGV may georeference the map and trace the features. This will be done for some local subwatershed delineations if UTRGV is unable to obtain a GIS layer but there is a map available. If only a paper map is available, then the map would be scanned and then georeferenced.

The purpose of this QAPP is to clearly delineate the roles and responsibilities of UTRGV as project manager as well as QA policy, management structure and procedures to implement the QA requirements during this project.

This project started in September 2018 and is estimated to be completed in August 2020. All task and deliverable dates are estimates.

See Appendix A for the contract scope of work and schedule of deliverables for a description of work defined in this QAPP.

## **Revisions to the QAPP**

### **Amendments**

Amendments to the QAPP must be approved to reflect changes in project organization, tasks, schedules, objectives, and methods; address deficiencies and non-conformances; improve operational efficiency; and accommodate unique or unanticipated circumstances. Requests for amendments are directed from the UTRGV Project Manager to the TCEQ NPS Project Manager in writing using the QAPP Amendment shell. The changes are effective immediately upon approval by the TCEQ QA Manager, TCEQ NPS Project Manager, and Lead NPS QA Specialist, or their designees.

Amendments to the QAPP and the reasons for the changes will be documented, and full copies of amendments will be forwarded to all persons on the QAPP distribution list by the UTRGV 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.

**Annual QAPP Reviews and Revisions** This QAPP shall be reviewed in its entirety and certified annually by the UTRGV Project Manager and NPS Project Manager. A letter certifying TCEQ NPS Modeling QAPP Shell, Last Updated: March 2017



this annual review must be submitted to the TCEQ NPS Project Manager no later than 90 days prior to the QAPP anniversary date. Amendments approved since QAPP approval (or most recent annual review, if applicable) will be included as an attachment along with the letter. Only non-substantive changes not affecting the project design or quality or quantity of work to be performed can be included in the annual certification letter. This includes organizational changes or schedule changes based on a contract amendment that do not impact data deliverables. If changes beyond these are necessary, a QAPP amendment must be submitted and approved before the annual review may be certified. The TCEQ NPS Project Manager is required to review the QAPP and provide certification of annual reviews to the TCEQ QA Manager and EPA Region 6 Project Officer no later than 30 days before QAPP anniversary date. If the QAPP expires, work described within this document must be halted.

If the project will extend beyond the third QAPP anniversary date, a full QAPP revision is required. This is accomplished by submitting a cover letter, a document detailing changes made if any, and three copies of the fully updated QAPP (including three sets of signature pages).

## A7 QUALITY OBJECTIVES AND CRITERIA

No data will be collected specifically for this project. Existing data from other sources will be used, and are described in Section B9. Data used for analyses will undergo quality assurance checks and review. The best available (and most defensible) data will be used based on the following criteria:

- 1) **Data source:** Datasets publicly distributed by local, regional, state or federal agencies and entities will be considered acceptable for the required data analyses. Unpublished data considered trustworthy by local governments and universities in the general watershed area will also be considered acceptable for use on this project. Other data not publicly distributed will be considered acceptable if they have been published and distributed in citable publicly available formats, such as books or journal publications, if no better sources for that data are available. The other data not publicly distributed will be the object of discovery activities by UTRGV.
- 2) **Currency:** More recently produced datasets will be considered superior to older datasets; datasets derived from primary data collected recently will be considered better than datasets derived from older data.
- 3) **Defensibility:** Metadata, or other descriptions of data quality and how the data were collected or developed, will be compiled when available for data sources.
- 4) **Accuracy:** Given the wide range of data types to be used, it is difficult to specify uniform criteria for positional or attribute accuracy. However, when more than one source of a given type of data is available, the data source with higher accuracy (as stated in the metadata) will be used.
- 5) **Resolution:** Data of higher spatial resolution are generally preferred for this project.

- 6) **Spatial and Temporal Representativeness:** Data should be representative of current conditions within the project watershed. For some data types that are unlikely to change on a large scale with time, such as elevation and soil type, older data may be considered representative of the more recent period. Where possible, only the most recent 20 years of data will be used to support findings and calculations.
- 7) **Completeness:** Datasets with fewer missing data are preferred over those with more missing data.
- 8) **Format:** Data should be available in electronic format. Files should be either: 1) in a grid or shape file type that can be read by ESRI ArcGIS; 2) in a text, database, or spreadsheet format with geographic coordinates, such as latitude and longitude or other defined coordinate system, that can be used in GIS; or 3) in a text, database, or spreadsheet format with spatial reference information, such as county name, that can be spatially joined to existing ESRI ArcGIS shapefiles.

See Section B10 for information on how data acquired under this QAPP will be managed.

#### **A8 SPECIAL TRAINING REQUIREMENTS/CERTIFICATION**

Work conducted by UTRGV for this project is covered under a documented quality management system. Personnel conducting work associated with this project are deemed qualified to perform their work through educational credentials, specific job/task training, required demonstrations of competency, and internal and external assessments. Records of educational credentials, training, demonstrations of competency, assessments, and corrective actions are retained by UTRGV and are available for review.

#### **A9 DOCUMENTS AND RECORDS**

The document and records that describe, specify, report, or certify activities, requirements, procedures, or results for this project are listed in table A9.1.

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

<b>Document/Record</b>	<b>Location</b>	<b>Retention<sup>*a</sup></b>	<b>Form<sup>*b</sup></b>
QAPPs, amendments, and appendices	UTRGV	5 years	Paper
QAPP distribution documentation	UTRGV	5 years	Paper
Progress report/final report/ data	UTRGV/TCEQ	5 years	Paper/Electronic
Training records to include educational credentials and demonstration of competency	UTRGV	5 years	Paper/Electronic
Data Collection Summary	UTRGV	5 years	Electronic
Corrective Action Reports	UTRGV	5 years	Electronic

<sup>\*a</sup> – After the close of the project

<sup>\*b</sup> – Electronic files should be ASCII (DOS) pipe delimited text files or MS Word/Excel; model input and output files can be archived in the format used by the modeling software, provided the capability of conversion to ASCII

(DOS) pipe delimited text files or MS Word/Excel (TCEQ compatible version) is maintained over the time of retention.

The TCEQ may request records at any time and/or elect to take possession of records at the conclusion of the specified retention period.

## **B1 SAMPLING PROCESS DESIGN (EXPERIMENTAL DESIGN)**

Does not apply to this QAPP.

## **B2 SAMPLING METHODS**

Does not apply to this QAPP.

## **B3 SAMPLE HANDLING AND CUSTODY**

Does not apply to this QAPP.

## **B4 ANALYTICAL METHODS**

Does not apply to this QAPP.

## **B5 QUALITY CONTROL**

Does not apply to this QAPP.

## **B6 INSTRUMENT/EQUIPMENT TESTING, INSPECTION AND MAINTENANCE**

Does not apply to this QAPP.

## **B7 INSTRUMENT/EQUIPMENT CALIBRATION AND FREQUENCY**

Does not apply to this QAPP.

## **B8 INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES**

Does not apply to this QAPP.

## **B9 NON-DIRECT MEASUREMENTS**

Geospatial data available from various local, regional, state, and federal organizations may be used for cartographic purposes. Maps developed for reports will be for illustrative purposes. Geospatial data utilized in maps of the study area may include land use, precipitation, soil type,

ecoregion, TCEQ monitoring location, TCEQ permitted outfall, gage location, city/county/state boundary, stream hydrology, reservoir, drought, road, watershed, municipal separate storm sewer system, urbanized area, basin, railroad, recreational area, area landmark, aerial photography, and park information. The above data come from the following reliable sources: United States Geological Survey (USGS), Texas Natural Resources Information System (TNRIS), TCEQ, US Census Bureau, Hidalgo, Willacy and Cameron Counties; USIBWC and all the cities within the boundaries of the watersheds including Edinburg, La Villa, Mercedes, Weslaco and San Juan. Geospatial data from these sources are accepted for use in this project maps based on the reputability of these data sources and the fact that there are no known comparable sources for these data. Geospatial data sources will be cited in reports and are listed in Table B9.1.

Other data that are compiled and published by other entities may also be used in preparing project reports. This may include long-term precipitation, census, ecoregion, and stream flow data, sanitary sewer overflows (SSOs), Texas Pollutant Discharge Elimination System (TPDES) permit violations, agricultural census data on livestock, emergency services data, wildlife population estimates, and groundwater resource information such as aquifer boundaries and well locations. Sources of these data are the USGS, National Weather Service, US Census Bureau, US Department of Agriculture USDA National Agricultural Statistics Survey, EPA Environmental Compliance History Online (ECHO), Texas Parks and Wildlife Department (TPWD), Arroyo Colorado Watershed Partnership and the Texas Water Development Board (TWDB). Data collected by these entities are assumed to have been verified and validated according to the requirements of the respective programs. Data compilations created for this project will be visually screened for errors. Geospatial data from these sources are accepted for use in project maps based on the reputability of these data sources and the fact that there are no known comparable sources for these data. Data will be cited in reports.

Data will be acquired via web portal when possible, however, email or in-person requests may be required to secure some of the listed data sources.

Qualified data will be evaluated for acquisition and used on a case-by-case basis using best available information.

Both routine monitoring data and targeted monitoring (ex. storm event) data will be acquired through this QAPP; however, only comparable data will be included in project reports.

All data used, including the source of the data, will be clearly identified in the final project report and listed in Table B9.1 and B9.2.

**Table B9.1 Geospatial Data Sources**

GIS Data	Source	Date	Comments
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GIS Data	Source	Date	Comments
LIDAR Data	USGS Willacy and Hidalgo <a href="https://data.tnris.org/collection/6a825941-a80b-4a61-a2b2-1da205f2f28b">https://data.tnris.org/collection/6a825941-a80b-4a61-a2b2-1da205f2f28b</a> IBWC Cameron County <a href="https://data.tnris.org/collection/27f30e8a-115a-4ad5-ace1-5e2aa4a53a70">https://data.tnris.org/collection/27f30e8a-115a-4ad5-ace1-5e2aa4a53a70</a>	2011	Subwatershed Delineation
Subwatersheds	Hidalgo Countywide Flood Map Modernization Project Hydrology Analysis TSDN Report (Hidalgo County and FEMA)	2005	Subwatershed Delineation
Hydrography	National Hydrography Dataset (NHD) Pre-staged Subregions <a href="https://tnris.org/stratmap/hydrography/">https://tnris.org/stratmap/hydrography/</a>	N/A	Subwatershed Delineation and Map Development
Local Drainage Network	City and County drainage network layers. HCDD Layers – <a href="#">Link</a> Pharr Layers - <a href="#">Link</a> Edinburg Layers - <a href="#">Link</a> Weslaco Layers - <a href="#">Link</a> Brownsville Layers - <a href="#">Link</a>	Most recent	Subwatershed Delineation and Map Development
Irrigation Canals	GIS layers available from Irrigation Districts and TAMU HCID#2 Layer - <a href="#">Link</a> TAMUK LRGV Maps – <a href="#">Link</a> HIDCC1 - <a href="#">Link</a>	Most recent	Subwatershed Delineation and Map Development
IBWC Gauge Locations	IBWC TCEQ provided GIS layer to UTRGV	N/A	Map development
Land Use/Land Cover	National Land Cover Database 2016 <a href="https://www.mrlc.gov/">https://www.mrlc.gov/</a>	2016	Map development



GIS Data	Source	Date	Comments
Land Use	Cities in each watershed	Most recent	Map development
Soil Map Unit Boundaries and Properties	NRCS SSURGO databases < <a href="https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx">https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx</a> > Web Soil Survey	various	Map development
Geology Units	USGS Geologic Atlas of Texas  Environmental Geologic Atlas of the Texas Coastal Zone-- Brownsville-Harlingen Area (Texas Bureau of Economic Geology)	Most recent  1980	Map development and watershed characterization
Urbanized Areas (2010)	U.S. Census Bureau TIGER/Line® Shapefiles < <a href="http://www.census.gov/cgi-bin/geo/shapefiles2010/layers.cgi">http://www.census.gov/cgi-bin/geo/shapefiles2010/layers.cgi</a> > < <a href="http://cfpub.epa.gov/npdes/stormwater/urbanmaps.cfm">http://cfpub.epa.gov/npdes/stormwater/urbanmaps.cfm</a> >	2010	Map development; define regulated stormwater
TCEQ Permitted Wastewater Outfalls	TCEQ GIS Site Layers Download Page < <a href="http://www.tceq.texas.gov/gis/download-tceq-gis-data">http://www.tceq.texas.gov/gis/download-tceq-gis-data</a> >	N/A	Map and hydrology development and pollution source analysis
TCEQ Assessment Units	TCEQ GIS Hydrology Layers < <a href="http://www.tceq.texas.gov/gis/download-tceq-gis-data">http://www.tceq.texas.gov/gis/download-tceq-gis-data</a> >	N/A	Map and hydrology development
Water Rights Diversion Points	TCEQ Water Rights Diversion Points < <a href="http://www.tceq.texas.gov/gis/download-tceq-gis-data">http://www.tceq.texas.gov/gis/download-tceq-gis-data</a> >	N/A	Map and hydrology development
Water and sewer service areas	TCEQ GIS Regulatory/ Administrative Boundaries, Water & Sewer Certificates of Convenience and Necessity Service Areas, < <a href="http://www.tceq.texas.gov/gis/boundary.html">www.tceq.texas.gov/gis/boundary.html</a> >	Present	Pollution source analysis



GIS Data	Source	Date	Comments
Census Data	U.S. Census <a href="https://www.census.gov/cgi-bin/geo/shapefiles/index.php">https://www.census.gov/cgi-bin/geo/shapefiles/index.php</a>	2018	Determine population per subwatershed.
Census Urban Areas	U.S. Census <a href="https://www.census.gov/cgi-bin/geo/shapefiles/index.php">https://www.census.gov/cgi-bin/geo/shapefiles/index.php</a>	2018	Determine regulated MS4 areas.
Roadways	TxDOT	Most recent	Map development
Roadways	Cities in each watershed	Most recent	Map development
Wells	TWDB Well locations <a href="http://www.twdb.texas.gov/mapping/gisdata.asp">http://www.twdb.texas.gov/mapping/gisdata.asp</a>	Most recent	Map development
TCEQ Surface Water Quality Monitoring Stations	TCEQ GIS Site Layers Download Page < <a href="http://www.tceq.texas.gov/gis/download-tceq-gis-data">http://www.tceq.texas.gov/gis/download-tceq-gis-data</a> >	N/A	Map development
Address Points	Hidalgo, Willacy, and Cameron Counties available at <a href="https://tnris.org/stratmap/address-points/">https://tnris.org/stratmap/address-points/</a>	2018	
Parcels	Hidalgo, Willacy, and Cameron Counties available at TNRIS <a href="https://tnris.org/stratmap/land-parcels/">https://tnris.org/stratmap/land-parcels/</a>	2018	
Sewer Service Areas	Coastal Zone – Texas AgriLife Extension Hidalgo and Cameron Counties – TWRI	2019	
OSSF Points	Coastal Zone – Texas AgriLife Extension Hidalgo and Cameron Counties - TWRI	2019	
PAD Database	Protected Areas database Department of the Interior < <a href="#">Link</a> >		Define areas that are protected such as National Wildlife Refuge.

GIS Data	Source	Date	Comments
Large Ranches South Texas	TCEQ NPS Team	2018	Show large South Texas ranch areas on maps.
Seagrass	TPWD <a href="https://tpwd.texas.gov/gis/">https://tpwd.texas.gov/gis/</a>	2016	Show seagrass in Laguna Madre.
Wildlife Management Areas	TPWD <a href="https://tpwd.texas.gov/gis/">https://tpwd.texas.gov/gis/</a>	2018	
Water Districts	TCEQ <a href="https://www.tceq.texas.gov/gis/download-tceq-gis-data">https://www.tceq.texas.gov/gis/download-tceq-gis-data</a>	2015	
Colonias	Rural Community Assistance Partnership <a href="#">Link</a>	2015	
Coastal Zone Boundary	General Land Office <a href="http://www.glo.texas.gov/land/land-management/gis/">http://www.glo.texas.gov/land/land-management/gis/</a>	2011	Map development
Existing Urban BMP locations	Information of existing BMPs will be gathered from cities	Most recent	
Areas of drainage project locations	Areas of existing and future drainage projects will be obtained from cities and drainage districts.	Most recent	Assess impact on subwatershed boundaries and flow

**Table B9.2 Non-Geospatial Data Sources**

Data	Source	Date	Comments
NPDS Wastewater Facility Pollutant Discharge data	Enforcement and Compliance History (ECHO) Online <a href="https://echo.epa.gov/">https://echo.epa.gov/</a>	Most recent	Assessment of potential sources and identification of permit limits
Sanitary Sewer Overflows	TCEQ Field Office	Most recent complete fiscal year	Assessment of potential sources

Data	Source	Date	Comments
MS4 Permit List	TCEQ website <a href="https://www2.tceq.texas.gov/wq_dpa/index.cfm">https://www2.tceq.texas.gov/wq_dpa/index.cfm</a>	Entire period of record	List of MS4 permits in watersheds
Wildlife numbers	Local TPWD and USFWS offices	Most recent information	Assessment of wildlife numbers in watershed
Livestock Numbers	USDA National Agriculture Statistics Service County-level agricultural census data <a href="https://www.nass.usda.gov/Publications/AgCensus/2017/index.php">https://www.nass.usda.gov/Publications/AgCensus/2017/index.php</a>	2017	Assessment of potential sources
Local city environmental data	Information such as tires collected, illegal dumping, and street sweeping will be gathered.	Most recent	Assessment of potential sources and assessment of existing BMPs
Existing Acres covered under WQMP	Existing acres covered under Water Quality Management Plans (WQMP) will be obtained from Texas Water Resources Institute in Weslaco	Most recent	Assessment of existing BMPs
Biological Assessments	Hidalgo, Cameron, Willacy Counties	Entire period of record	Spatial and temporal trends
Climatic Data	IBWC, NCEI, and NOAA. Rain gages near and within watershed.	Entire period of record	Characterization of historical and recent climatic conditions associated with routine and storm monitoring events
Drinking Water Data	Cities	Entire period of record	Temporal water quality trends
Flooding	Local groups information on flooding	Available studies	
Groundwater Levels	TWDB Statewide Program	Entire period of record for all stations	Analysis of recharge, Desired Future Conditions, Trend analysis of groundwater level fluctuations
Groundwater Quality	Various Studies from BSEACD, USGS, TWDB, TWON, Different Cities		Spatial and temporal trends

Data	Source	Date	Comments
Hydrology	USGS Flow Data	Entire period of record	Loading calculations, flow-adjustment of water quality data. Characterization of long-term flow conditions
Monitoring Data	TCEQ SWQMIS Database (Entire period of record for all project stations. TCEQ ID 22004, 22003, 20930, and 20879)	Entire period of record	Spatial and temporal trends, water quality parameters
Flow Data	USIBWC (Entire period of record for all project stations. IBWC ID 08470100, 08470050, 08470200 and 08470301)	Entire period of record	Entire period of record for all project stations. IBWC ID 08470100, 08470050, 08470200 and 08470301
Flow Data	Hidalgo, Cameron, Willacy Counties and Cities on each watershed	Entire period of record for all project stations	Stormwater quality trends
Wells	TWDB	Entire period of record	Well location, owner, driller, and data

All data sources will be clearly documented in final project report and within annual updates to the QAPP.

## **B10 DATA MANAGEMENT**

### **Systems Design**

At UTRGV, the data processing and management equipment are DELL computers with standard UTRGV Center software/security configuration and use the Windows 7 operating system. The data acquired for this project will be maintained in Microsoft Access database and/or Excel spreadsheet format and visually screened for errors. GIS data will be maintained in individual shapefiles or geodatabases.

### **Record-keeping and Data Storage**

UTRGV record keeping and document control requirements are contained in this QAPP. A copy of the database is backed up regularly on an external hard drive. If necessary, disaster recovery will be accomplished by information resources staff using the backup database. The database will be backed up on a quarterly basis.

### **Archives/Data Retention**

All UTRGV data are kept on an external backup hard drive as well as a UTRGV provided shared hard drive throughout the university network. All acquired data related to this project will be kept within the shared drive on UTRGV servers as well as on backup within the external hard drive.

### Data Verification/Validation

The control mechanisms for detecting and correcting errors and for preventing loss of data during data reduction, data reporting, and data entry are contained in Sections D1 and D2.

### Data Handling

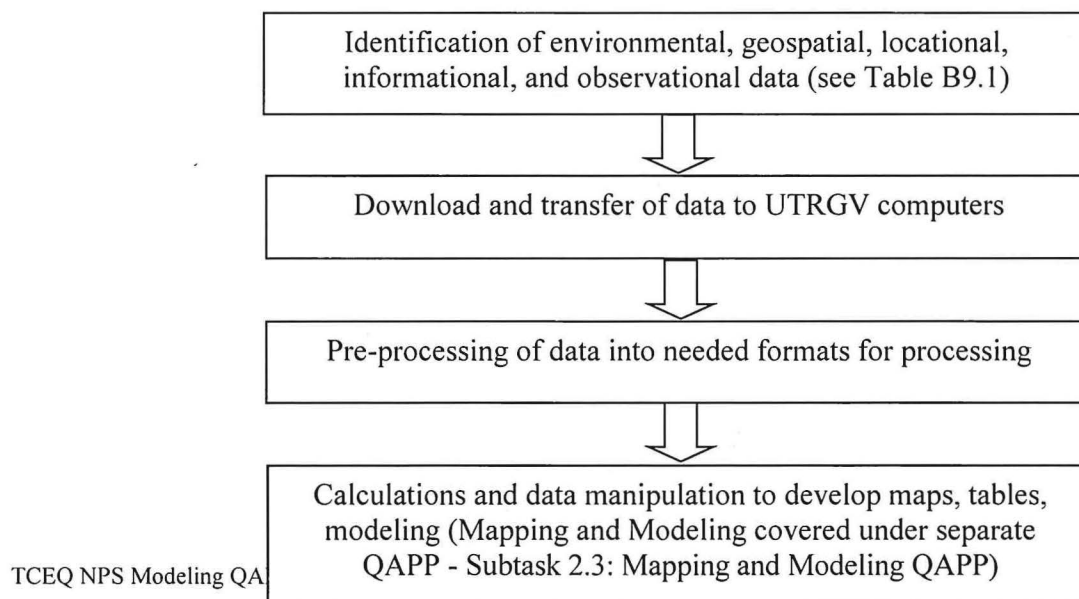
Data are processed using the Microsoft Access 2013 suite of tools and applications. Data integrity is maintained by the implementation of password protections which control access to the database and by limiting update rights to a select user group. No data from external sources are maintained in the database. The database administrator is responsible for assigning user rights and assuring database integrity.

### Hardware and Software Requirements

**Table B10.1 Listing of Project Hardware and Software**

Equipment & software name	Type	Specification	Use
Dell PC desktop/laptop computers	Hardware	Intel Core 2 DUO, CPU 3.00 GHz 4.0 GB RAM, Windows 7	Support monitoring data storage and uploading activities
ArcGIS 10.4.5 plus Spatial Analyst Extension	Software	Windows interface	View and compile monitoring results
Microsoft Office Software 2013 (Excel, Word, Powerpoint, Access)	Software	Windows platform	Data preparation, load calculations, report writing, presentations

**Figure B10.1** A flow chart is provided below that traces the path of the data from acquisition to final use and storage.





Back-up provided and long-term storage of all data and documents

All project data are stored in a unique directory established for the project with additional subdirectories as needed for organization of data and files.

Document control is provided by all project staff only using data and files in the project directory and providing different file names along when editing or manipulating the files. Staff retain older versions of documents and workbooks in the project directory in the event errors are detected, which may necessitate use of earlier versions of the documents and data for expedient correction. Daily backup provides additional safeguards in this area of document control.

The computations and data in Excel workbooks used to develop charts and tables are checked by the UTRGV Project Manager prior to development of draft reports. Any errors detected are noted and appropriate project staff directed to make needed corrections. Tables in reports are checked for accuracy by the UTRGV Project Manager prior to submitting the draft report to TCEQ.

## **Personnel**

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

Andrew Ernest is UTRGV Principal Investigator and will provide overall project management for the project. Ahmed Mahmoud is the UTRGV project manager and responsible for ensuring that the data are managed according to the data management plan and QAPP.

Abdoul Oubeidillah is the UTRGV Center QAO and Data Manager. The Data Manager will have primary responsibility for performing all tasks related to data management. The UTRGV Data Manager/QAO will coordinate the cooperating agencies to obtain data files needed for the project and to ensure that the data provided in the source files is accurate and unambiguous. The Data Manager/QAO will be assisted, on an as-needed basis, by other UTRGV personnel. Dr. Oubeidillah is responsible for ensuring that project data are scientifically valid, legally defensible, of known precision, accuracy, integrity, meet the data quality objectives of the project, and are reportable to TCEQ.

Tim Cawthon is the TCEQ Project Manager and is responsible for providing state oversight of the project and for receiving the project reports.



**Quality Assurance/Control**  
See Section D of this QAPP.

## **C1 ASSESSMENTS AND RESPONSE ACTIONS**

The following table presents types of assessments and response action for 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	UTRGV Project Manager	Monitoring of the project status and records to ensure QAPP requirements are being fulfilled. Monitoring and review of subcontractors performance and data quality	Report to TCEQ in Quarterly/Monthly Report. Ensure project requirements are being fulfilled.
Technical 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	30 days to respond in writing to the TCEQ to address corrective actions

### **Internal Assessment**

Since this project is primarily a geospatial data and secondary data analysis endeavor, traditional performance and system audits are not appropriate. Instead, the information generated as part of the project will be evaluated by TCEQ with submitted deliverables according to the contract.

Project deliverables will be internally quality controlled by the TCEQ NPS Project Manager's in-house review. The TCEQ NPS Project Manager will maintain overall responsibility for examining the contracted work to ensure methodologies and processes are consistent with the procedures outlined in this QAPP.

## Corrective Action

Deficiencies are any unauthorized deviations from the approved QAPP and procedures referenced in the QAPP. Deficiencies may invalidate resulting data. All deficiencies from the QAPP require documentation of the nonconformance and corrective action. Deficiencies must be documented in a Corrective Action Plan (See Appendix B for the form and an example) and corrected in a timely manner. Corrective action may include for data to be discarded and re-collected. Deficiencies are documented in logbooks by project staff. It is the responsibility of the UTRGV Project Manager, in consultation with the UTRGV QAO, to ensure that the actions and resolutions to the problems are documented and that records are maintained in accordance with this QAPP. Nonconformances and corrective actions will be conveyed to the TCEQ NPS Project Manager, in a manner fitting the severity of the deficiency:

- **For deficiencies that impact the quality or quantity of data:** If the UTRGV Project Manager, in consultation with project staff, determines that the deficiency can have serious effect on the validity, integrity, quality, or quantity of the data, then a nonconformance must be communicated to the TCEQ NPS Project Manager and Lead NPS QAS immediately in writing. A Corrective Action Plan Form (See Appendix B for the form and an example) must be submitted to the TCEQ NPS Project Manager and Lead NPS QAS within 14 days of the deficiency occurring.
- **For deficiencies that do not impact the quality or quantity of data:** If the UTRGV Project Manager, in consultation with project staff, determines that the deficiency will not have a serious effect on the validity, integrity, quality, or quantity of the data, then the nonconformance and corrective action must be documented in a timely manner. The deficiency will be communicated to the TCEQ NPS Project Manager through the Corrective Action Status Table (see Appendix C for the table and an example) to be included with the quarterly progress report.

The UTRGV Project Manager is responsible for implementing and tracking corrective actions. All Corrective Action Plans will be documented on the Corrective Action Status Table, which will be submitted to the TCEQ NPS Project Manager with the quarterly progress report for review and approval. Records of TCEQ audit findings and corrective actions are maintained by both the TCEQ and the UTRGV QAO. Documentation of corrective action to address audit findings will be submitted to the TCEQ within 30 days of receipt of audit 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.

## Corrective Action Plans

Corrective Action Plans should:

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- Identify the deficiency, 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
- Include a description of the need for Corrective Action
- Include a description of cause(s), determine solution, and propose an action plan
- Identify personnel responsible for action
- Establish timelines and provide a schedule
- Document the corrective action

## **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 and the contract schedule of deliverables.

Progress Report - Submittal of progress reports will be quarterly. Format of the submitted progress report will be as specified in the contract or work orders. Reports should provide enough information so the TCEQ NPS Project Manager can evaluate the effort.

Task Reports - Summarize the activities conducted under individual Tasks for the project period including a description and documentation of major Task activities and the evaluation any results.

Watershed Characterization Report – This report will present data collected, compiled, and analyzed to characterize watershed conditions.

Final Report - Summarizes the UTRGV'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.

Corrective Action Report (CAR) – Identifies any deficiencies and nonconformances. The cause(s) and program impacts are discussed. The completed corrective actions are documented, and the report is submitted to the TCEQ NPS Project Manager with the first progress report occurring after the deficiencies and/or nonconformance was identified.

Audit Report and Response - Following any audit performed by UTRGV, a report of findings, recommendations, and responses are sent to the TCEQ NPS Project Manager in the quarterly/monthly progress report. Such reports will include model performance assessments, calibration, and validation performance determination.

## **Reports to UTRGV Project Management**

Progress report – Summarizes the UTRGV activities for each task; reports monitoring status, problems, delays, and corrective actions; and outlines the status of each task's deliverables.

## **Reports by TCEQ Project Management**

Contractor Evaluation - The UTRGV participates in a Contractor Evaluation by the TCEQ annually for compliance with administrative and programmatic standards. Results of the evaluation are submitted to the UTRGV 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. Validation means those processes taken independently of the data-generation processes to evaluate the technical usability of the verified data with respect to the planned objectives or intention of the project. Additionally, validation can provide a level of overall confidence in the reporting of the data based on the methods used.

The UTRGV Data Manager is responsible for ensuring that data are properly reviewed, verified, and submitted in the required format for the project database. Finally, the UTRGV QAO is responsible for validating that all data collected meet the DQOs of the project and are suitable for reporting.

Data collected by the TCEQ, the USGS, USIBWC, Hidalgo, Cameron, Willacy Counties and all the cities on each watershed; and Texas Clean Rivers Program partners have been reviewed, verified, and validated according to the requirements of the respective programs prior to their use in this project. The sources of GIS data for the project, i.e., TCEQ, National Hydrology Dataset (NHD), National Land Change Database (NLCD), NRCS, and U.S. Census Bureau, undergo review, verification, and validation of the shapefiles and other spatial resources by their respective programs before the data and information are publicly available and prior to use in this project. Non-geospatial data include SSOs, livestock from the agricultural census, and regulated dischargers.

## **D2 VERIFICATION AND VALIDATION METHODS**

Data collected from noted program partners have been verified and validated according to the requirements of the respective programs prior to their use in this project. Data compilations created for this project will be visually screened for errors by the UTRGV.

All other data for this portion of the project (e.g., land use, urban areas, population projections, DEMs, stream layers, and population projections) as provided in Table B9.1 and B9.2 have been collected and made publicly accessible by authoritative sources such as the USGS, USDA, EPA, Hidalgo, Cameron, Willacy Counties and all the cities on each watershed; and U.S. Census Bureau. Data from these sources will be considered as verified and validated by the various agencies providing the data. However, data compilations created for this project will be visually screened for errors. Any errors detected by project staff will be reported to the UTRGV Project Manager and, if necessary, to the TCEQ Project Manager for resolution. Issues which can be readily corrected, e.g., removal of outlier data, will be documented and the data either removed or corrected prior to further analysis.

The UTRGV Project Manager and QAO are each responsible for validating that the verified data are scientifically valid, defensible, of known precision, bias, integrity, meet the data quality objectives of the project, and are reportable to TCEQ. One element of the validation process involves evaluating the data again for anomalies. Any suspected errors or anomalous data must be addressed by the manager of the task associated with the data, before data validation can be completed.

A second element of the validation process is consideration of any findings identified during the assessments listed in Table C1.1. Any issues requiring corrective action must be addressed, and the potential impact of these issues on previously collected data will be assessed by the UTRGV QAO. The UTRGV Project Manager, with the concurrence of the UTRGV QAO validates that the data meet the data quality objectives of the project and are suitable for reporting to TCEQ.

### **D3 RECONCILIATION WITH USER REQUIREMENTS**

Data acquired under this QAPP will be used for education and outreach, mapping, and modeling efforts. The mapping and modeling efforts to predict future watershed conditions will not be covered under this QAPP. In the future, a separate Mapping and Modeling QAPP will be developed for estimating, mapping, and modeling future development/watershed conditions and associated water quality impacts through the use of future development scenarios (Geographical Information System (GIS) based tools), load duration curves for total suspended solids (TSS), nutrients and bacteria, and Spatial Explicit Load Enrichment Calculation Tool (SELECT) calculations for Bacteria.



**APPENDIX A. CONTRACT SCOPE OF WORK AND SCHEDULE OF  
DELIVERABLES**

**Task 1: Project Administration**

**Objective:** To effectively administer, coordinate, and monitor all work performed under this project including technical and financial supervision and preparation of status reports.

**Subtask 1.1: Project Oversight** — The Performing Party 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's authorization, the Performing Party may secure the services of subgrantee(s)/subcontractor(s). Project oversight status will be provided to TCEQ with the Quarterly Progress Reports (QPRs).

**Subtask 1.2: QPRs** — The Performing Party will submit QPRs to the TCEQ Project Manager by the 15th of the month following each state fiscal quarter for review by the TCEQ Project Manager and incorporation into the United States Environmental Protection Agency's (EPA) Grant Reporting and Tracking System. QPRs will include reporting on status of Deliverables and proposed revisions to due dates, narrative description of progress by Task, and status of nonconformances/corrective actions. A template for the QPR will be provided to the Performing Party by the TCEQ Project Manager.

**Subtask 1.3: Reimbursement Forms** — See the Special Terms and Conditions, 8. Invoice Submittal.

**Subtask 1.4: Contract Communication** — The Performing Party will participate in a post-award orientation meeting with TCEQ within 30 days of Contract execution.

The Performing Party will maintain regular telephone and/or e-mail communication with the TCEQ Project Manager regarding the status and progress of the project and any matters that require attention between QPRs. This will include a quarterly conference call to discuss Project Tasks, financial status, Quality Assurance Project Plan (QAPP), corrective actions and any other matters that require attention. The TCEQ Project Manager may request additional information from the Performing Party prior to the call or meeting. The Performing Party will submit meeting notes (action items at a minimum) to the TCEQ Project Manager within seven days.

The quarterly conference call held the first quarter of each fiscal year of the project will be used to discuss, at a minimum, any staff changes, the previous year's performance, budget estimates, invoicing issues, quality assurance issues, overall project progress, and a plan for the current fiscal year. The Performing Party will submit meeting notes (action items at a minimum) to the TCEQ Project Manager within seven days.

Matters that will be communicated to the TCEQ Project Manager include, but are not limited to:

- Notification a minimum of 14 days before the Performing Party has scheduled public meetings or events, initiation of construction, or other major Task activities.
- Notification within two working days regarding events or circumstances that may require changes to the Budget, Scope of Work, or Schedule of Deliverables.

**Subtask 1.5: Coordination Meeting with EPA** — The Performing Party will attend a project update and coordination meeting with EPA in Dallas upon request by TCEQ and EPA to share progress on goals, measures of success, challenges, and opportunities.

**Subtask 1.6: Annual Report Article** — The Performing Party will provide an article for the Nonpoint Source (NPS) Annual Report upon request by TCEQ. The article will include a brief summary of the project and describe the activities of the past fiscal year.

**Subtask 1.7: Contract Budget Updates** — The Performing Party will discuss annual fiscal year budgets with the TCEQ Project Manager on a quarterly basis. Starting in the second year of the project, the Performing Party will provide an Annual Budget Update that details state fiscal year spending projections as associated with planned project activities. These updates will be discussed quarterly at a minimum. They will be revised when fiscal year spending projections change by ten percent or more, or upon request by the TCEQ Project Manager. The update in the final year of the project will include a budget for all remaining project activities. The template for the Annual Budget Update will be provided by the TCEQ Project Manager.

**Deliverables:**

- QPRs
- Reimbursement forms
- Post Award Meeting and notes
- Conference call notes and action items
- Coordination meeting with EPA (upon request)
- Annual Report article and pictures (upon request)
- Contract Budget updates
- Annual Budget updates

**Task 2: Quality Assurance**

**Objective:** To refine, document, and implement data quality objectives (DQOs) and quality assurance/quality control (QA/QC) activities that ensure data of known and acceptable quality are generated by this project.

**Subtask 2.1: QAPP Planning Meetings** — The Performing Party will schedule a QAPP planning meeting with the TCEQ Project Manager, QA staff, technical staff, and contractors within 30 days of Contract execution, to implement a systematic planning process based on the elements in the TCEQ NPS QAPP Shell. The information developed during this meeting will be incorporated into a QAPP. The storage location of data records, and how data will be coded, will also be determined during these meetings. The Performing Party may conduct additional meetings to determine whether changes to an existing QAPP are needed.

**Subtask 2.2: QAPP** — The Performing Party will develop and submit to TCEQ a QAPP with project-specific DQOs and other components consistent with the following documents:

- TCEQ NPS QAPP Shell(s)
- EPA Requirements for QAPPs (QA/R5)
- EPA Guidance for Geospatial Data QAPPs (QA/G-5G)
- EPA QAPP Requirements for Secondary Data Research Projects
- TCEQ Surface Water Quality Monitoring (SWQM) Procedures

The Performing Party will develop the QAPP in consultation with the TCEQ Project Manager, QA staff, and contractors. The Performing Party will submit the QAPP to TCEQ at least 120 days prior to the scheduled initiation of environmental data operations. The QAPP will be signed/fully approved by TCEQ and, if necessary, EPA, before any environmental data operations begin.

Activities covered under this QAPP:

- Acquisition of existing water quality and quantity data from project partners
- Analysis of existing data

Tasks covered under this QAPP:

- Tasks 2, 3, and 5

Tasks NOT covered under this QAPP:

- Tasks 1 and 4

**Subtask 2.3: QAPP Annual Reviews and Revisions** — The Performing Party will submit documentation certifying its annual review of QAPPs no less than 90 days prior to the QAPP anniversary date. Amendments approved since the initial QAPP approval or a subsequent certified annual review (if applicable) will be submitted along with the certification. If extensive changes to a QAPP are necessary, a full revision is required. Once TCEQ certifies the annual review or approves the full revision, the QAPP effective period is extended an additional year. No work described in a QAPP will be conducted outside the effective period of the QAPP.

**Subtask 2.4: QAPP Amendments** — The Performing Party will submit Draft QAPP Amendments for TCEQ's review when changes to QAPPs are necessary. Draft QAPP Amendments will be submitted no less than 90 days prior to the scheduled initiation of changes and will be accompanied with a justification, summary of changes, and detail of changes. The Performing Party will submit Final QAPP Amendments within 30 days of receipt of any comments provided by TCEQ. The Performing Party will ensure that changes conveyed within Amendments are not implemented until the Amendment is fully approved by TCEQ.

**Deliverables:**

- QAPP Planning Meeting notes
- Draft and Final QAPP
- QAPP Annual Reviews and Revisions
- Draft and Final QAPP Amendments

### **Task 3: Watershed Characterization – Data Evaluation and Analysis**

**Objective:** To collect data and information to identify the causes of water quality impairments and issues in the watersheds and to identify the potential sources of pollution.

**Subtask 3.1: Assemble Existing Data and Information** — The Performing Party will gather existing data and information pertaining to water quality impairments and issues in the watersheds. This data and information will, to the extent possible:

- Describe relevant watershed characteristics;
- Support Geographic Information Systems analysis;
- Support preliminary delineation of subwatershed boundaries;
- Support identification of the causes of water quality impairments and issues; and
- Support identification of potential sources of pollution.

This data and information will be assembled into a data inventory for the watersheds. The data and information will be presented in appropriate formats including graphs, tables, and maps. (See EPA Handbook, Chapter 5).

**Subtask 3.2: Cyberinfrastructure Establishment and Database Development** — The Performing Party will convert the existing interactive map (developed by the Stormwater Task Force) into cyberinfrastructure to establish a database for the watershed areas.

Example data and analysis that may be incorporated into the database includes:

- Land use/Land Cover Data;
- Water quality and flow data;
- Flood studies;
- Subwatershed boundaries;
- Urban and stormwater drainage information;
- Irrigation and drainage district information;
- Wastewater treatment facility (WWTF) information;
- Colonia wastewater information; and
- On-site sewage facility (OSSF) information.

**Subtask 3.3: Analyze Existing Data and Information** — The Performing Party will analyze the existing data and information and, to the extent possible, characterize water quality conditions, watershed conditions, and sources of pollution contributing to water quality impairments and issues. The analysis will:

- Produce a conceptual model of the linkage (cause and effect relationship) between instream water quality problems and sources of pollution in the watersheds;
- Lead to an understanding of where and when water quality impairments and/or issues occur and what could be causing the impairments and issues; and
- Provide the basis for the selection of the analytical method that will be used to estimate pollutant loadings from sources in the watersheds that contribute to water quality impairments and issues conducted in future projects.

**Subtask 3.4: Watershed Characterization and Next Steps Report** — The Performing Party will develop a report summarizing information developed to characterize the watersheds and identify potential causes and sources of pollution. The report will partially satisfy Element A, be submitted for approval to the TCEQ Project Manager, and be presented to stakeholders for feedback. Components of the report will include but is not limited to:

- Identification, mapping, and description of the potential sources of pollution;
- Preliminary delineation of subwatersheds based on information gathered;
- Flow and water quality graphs for existing or historical stations;
- Quantification of loads from permitted point sources;
- Identify additional data and information that is needed to support a future analytical method for estimating pollutant loadings;
- Citation and explanation of data sources, estimates, and assumptions;
- Conceptual model of the cause and effect linkage between pollutant sources and instream water quality data; and
- Provide details about the next steps to be taken for each of the three waterbodies, such as filling data gaps, selected analytical methods for estimating pollutant loads, and WPP development.

**Deliverables:**

- Summary of existing data and information
- Cyberinfrastructure establishment and database development



- Interim Existing Data and Information Analysis Report
- PowerPoint for presentation to stakeholders
- Draft and Final Watershed Characterization and Next Steps Report

**Task 4: Partnership Coordination**

**Objective:** To engage watershed partners, involve stakeholders in participation of planning and educational activities, conduct local stakeholder meetings, and provide regular updates to stakeholders. The Performing Party will facilitate meetings of three Watershed Stakeholder Groups for the future development of WPPs.

**Subtask 4.1: PPP** — The Performing Party will develop one PPP, that covers each of the three watersheds, which details the strategy for engaging the public and stakeholders in the watershed planning process. The PPP will include, but is not limited to, stakeholder group ground rules, stakeholder group structure, an outline of the goals of future meetings, topics, targeted outreach and education plan, and an estimated timeline that will provide an outline for project personnel to follow as the watershed planning and implementation process is conducted. The PPP will be presented to stakeholders for feedback, and approved by the TCEQ Project Manager.

**Subtask 4.2: Facilitate and Coordinate Meetings** — The Performing Party will implement the PPP by working to identify and meet individually with key stakeholders across the watersheds on an individual or small group basis. The purpose of these meetings will be to inform key stakeholders of the water quality issues and solicit their input on goals, objectives, and indicators that will help in the watershed planning process.

**Subtask 4.3: Stakeholder Group Activities** — The Performing Party will implement the PPP by mobilizing three stakeholder groups (one in each of the three watersheds) and their activities, including:

- Overseeing the formation and continued facilitation of the three Stakeholder Groups;
- Hosting and facilitating stakeholder group meetings two times per year for each of the three watersheds for a total of six meetings per year;
- Hosting and facilitating one annual regional watershed stakeholder meeting for the three stakeholder groups.
- Leading the stakeholder groups in developing/refining goals that will include meeting water quality standards;
- Identifying issues of concern and address significant issues where possible;
- Presenting to the stakeholder groups and soliciting feedback of major deliverables; and
- Gaining community acceptance of the project.

**Subtask 4.4: Dissemination of Project Information** — The Performing Party will conduct public outreach in accordance with the PPP to inform the public about the project and its status, sources of pollution, and how the public/stakeholders can address water quality issues. Activities will include but are not limited to:

- Hosting a project webpage;
- Communicating via media sources; and
- Hosting and/or participating in public education and outreach events.

**Subtask 4.5: Partnership Coordination Report** — The Performing Party will develop a report summarizing the public outreach activities. The report will be submitted for approval to the TCEQ Project Manager and be presented to stakeholders for feedback.

**Deliverables:**

- PPP;
- Documentation of individual key stakeholder meetings, including agendas, presentations, and sign in sheets, minimum of three (3) per quarter;
- Raymondville Drain Stakeholder Group - Documentation of group meetings, including agendas, press releases, presentations, and sign in sheets, minimum of two (2) per year;
- Hidalgo Main Stakeholder Group - Documentation of group meetings, including agendas, press releases, presentations, and sign in sheets, minimum of two (2) per year;
- North Floodway Stakeholder Group - Documentation of group meetings, including agendas, press releases, presentations, and sign in sheets, minimum of two (2) per year;
- Regional Watershed Stakeholder Meeting (Annual)
- Documentation of public education and outreach events, including agendas, press releases, presentations, and sign in sheets, minimum of three (3) per year;
- Documentation of project webpage development and quarterly updates; and
- Draft and Final Partnership Coordination Report

**Task 5: Final Report**

**Objective:** The Performing Party will produce a Final Report that summarizes all activities completed and conclusions reached during the project. The Final Report will describe project activities, and identify and discuss the extent to which project goals and purposes have been achieved, and the amount of funds spent on the project. The Final Report will emphasize successes, failures, lessons learned, and will include analyses estimating the projects' water quality improvements and load reductions, if applicable. The Final Report will summarize all the Task Reports in either the text or as appendices.

**Subtask 5.1: Draft Final Report** — At least 30 days prior to submitting the Final Report, the Performing Party will provide a Draft Final 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 report will document all Deliverables under this Scope of Work. The Draft Final Report will be structured per the following outline:

- Title
- Table of Contents
- Project Significance and Background
- Study Area
- Summary of all Task Reports and final approved QPR
- Amount of project funding and amount spent
- Discussion; include deliverables not completed, lessons learned, recommendations
- Water quality results achieved /estimated load reductions (if applicable to project)
- Appendices (if needed)

**Subtask 5.2: Final Report** — The Performing Party will revise the Draft Final Report to address comments provided by the TCEQ Project Manager and EPA. At least two weeks

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before the expiration of the Contract, the Performing Party will submit the Final Report to the TCEQ Project Manager, who will subsequently submit it to the EPA.

**Deliverables:**

- Draft Final Report
- Address TCEQ/EPA comments
- Final Report

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Schedule of Deliverables

Task No.	Task Deliverable	Due Date
<b>1 Project Administration</b>		
1.2	QPRs	The 15 <sup>th</sup> of the month following each state fiscal quarter
1.3	Reimbursement Forms	See Special Terms and Conditions, 8. Invoice Submittal
1.4	Post-Award orientation meeting and notes	Meeting within 30 days of Contract execution, meeting notes within two days of meeting.
1.4	Conference call notes and action items	Quarterly, notes within seven days of meeting
1.5	EPA coordination meeting	Upon request
1.6	Annual Report Article	Upon request
1.7	Contract Budget updates	Discussed quarterly and updated as needed
1.7	Annual Budget updates	Quarter 5
<b>2 Quality Assurance</b>		
2.1	QAPP planning meetings notes	Meeting within 30 days of Contract execution
2.2	Draft QAPP	At least 120 days prior to the scheduled initiation of environmental data operations
2.2	Final QAPP	30 days prior to the scheduled initiation of environmental data operations
2.3	QAPP Annual Reviews and Revisions	No less than 90 days prior to the QAPP anniversary date.
2.4	Draft QAPP Amendments	No less than 90 days prior to the scheduled initiation of changes or additions to activities listed in the current QAPP
2.4	Final QAPP Amendments	Within 30 days of receipt of TCEQ comments
<b>3 Watershed Characterization - Data Evaluation and Analysis</b>		
3.1	Summary of existing data and information	Quarter 4, Month 1
3.2	Database Establishment	Quarter 3, Month 1
3.3	Interim Existing Data and Information Analysis Report	Quarter 4, Month 2
3.4	PowerPoint for presentation to stakeholders	Quarter 6, Month 2
3.5	Draft Watershed Characterization and Next Steps Report	Quarter 6, Month 2
3.5	Final Watershed Characterization and Next Steps Report	Quarter 8, Month 2

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Task No.	Task Deliverable	Due Date
<b>4 Partnership Coordination</b>		
4.1	PPP	Quarter 2, Month 1
4.2	Documentation of key stakeholder meetings, including agendas, presentations, and sign in sheets (minimum 3 per quarter)	Quarterly
4.3	Raymondville Drain Stakeholder Group - Documentation of group meetings, including agendas, press releases, presentations, and sign in sheets (minimum 2 per year)	Quarters 2, 4, 6, and 8
4.3	Hidalgo Main Stakeholder Group - Documentation of group meetings, including agendas, press releases, presentations, and sign in sheets, minimum of two (2) per year;	Quarters 2, 4, 6, and 8
4.3	North Floodway Stakeholder Group - Documentation of group meetings, including agendas, press releases, presentations, and sign in sheets, minimum of two (2) per year;	Quarters 2, 4, 6, and 8
4.3	Annual Regional Watershed Stakeholder Meeting for the three stakeholder groups	Quarter 4 and Quarter 8
4.3	Documentation of public education and outreach events, including agendas, press releases, presentations, and sign in sheets (minimum 3 per year, total of 6)	Quarters 2-7
4.4	Documentation of project webpage and updates	Quarterly, in QPR
4.5	Draft Partnership Coordination Report	Quarter 8, Month 1 (with Final Report)
4.5	Final Partnership Coordination Report	At least two weeks prior to the end of the Contract (with Final Report)
<b>5 Final Report</b>		
5.1	Draft Final Report	Quarter 8, Month 1
5.1	Address TCEQ/EPA comments	Within 30 days of TCEQ comments
5.2	Final Report	At least two weeks prior to the end of the Contract



**Appendix B.**  
**Corrective action plan form**

Appendix B - Corrective Action Plan Form

Nonconformance Report and Corrective Action Plan
QAPP Title: _____ QAPP Contractor: _____ Issued by: _____ Date of Occurrence: _____ Report No.: _____ Date Issued: _____
Description of deficiency
Root Cause of deficiency
Programmatic Impact of deficiency
Does the seriousness of the deficiency require immediate reporting to the TCEQ? If so, when was it reported?
Corrective Action to address the deficiency and prevent its recurrence
Proposed Completion Date for Each Action
Individual(s) Responsible for Each Action
Method of Verification
Date Corrective Action Plan Closed?

**Example Corrective Action Plan Form**

<b>Nonconformance Report and Corrective Action Plan</b>
<b>QAPP Title:</b> Watershed Protection Plan Implementation – LID BMP Monitoring QAPP <b>QAPP Contractor:</b> River Authority <b>Issued by:</b> Jane Doe <b>Date of Occurrence:</b> 7/15/2014 <b>Report No.:</b> 1 <b>Date Issued:</b> 7/25/2014
<b>Description of deficiency</b> The pavement monitoring station at the university is measuring a larger runoff volume than is estimated possible. Runoff measured is higher than the total precipitation volume calculated by multiplying the catchment area by the precipitation measured at the site.
<b>Root Cause of deficiency</b> (1) It is possible that the drainage area was not measured accurately, it may be larger. (2) The outfall of the monitoring station might not adequately allow runoff to flow through causing pooling around the flow-measuring point. The accumulation of non-flowing water could be confounding the flow meter since its physical principal of measurement is hydrostatic pressure caused by water depth.
<b>Programmatic Impact of deficiency</b> The illogical results of the pavement runoff measurement indicate that further calibration of the equipment is necessary. Data collected at this event are not able to be used in analysis or results.
<b>Does the seriousness of the deficiency require immediate reporting to the TCEQ? If so, when was it?</b> Yes, it was reported to the TCEQ NPS Project Manager via email on 7/18/2014.
<b>Corrective Action to address the deficiency and prevent its recurrence</b> A survey will be conducted on the site to determine the ridge of the catchment area. A wider and deeper channel will be dug out at the monitoring point outfall to ensure all the flow drains away from the measuring point. Storm event runoff will not be measured at this site until this work has been completed.
<b>Proposed Completion Date for Each Action</b> 8/15/2014
<b>Individual(s) Responsible for Each Action</b> David Lopez, Contractor Project Manager
<b>Method of Verification</b> Results of the catchment area survey will be emailed to the TCEQ NPS Project Manager. Photos of the modified measurement site will be emailed to the TCEQ NPS Project Manager.
<b>Date Corrective Action Plan Closed?</b> <i>The TCEQ NPS Project Manager will provide a closed date once the corrective action has been verified.</i>

**Appendix C.**  
**Corrective Action Plan Status Form**

**Corrective Action Status Table**

Corrective Action #	Date Issued	Description of Deficiency	Action Taken	Date Closed

**Corrective Action Status Table Example**

Corrective Action #	Date Issued	Description of Deficiency	Action Taken	Date Closed
1	7/25/2014	Runoff measured at pavement was greater than total area runoff.	The area is being surveyed to ensure the catchment area size is correct. The monitoring station location is being modified to ensure runoff flows through properly.	
2	8/1/2014	Sample residual insufficient for analysis of TSS.	Data estimated but questionable, not will not be submitted to TCEQ.	8/8/2014



**Appendix D.**  
**ADHERENCE Letter**

TO:                (name)  
                      (organization)

FROM: (name)  
                      (organization)

RE:                Contractor Name, QAPP Title

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

(Address)

I acknowledge receipt of the "QAPP Title, Revision Date". I understand 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 will comply with the document contents pertaining to my program. Furthermore, I will ensure that all staff members participating in modeling activities will be required to familiarize themselves with the document contents and adhere to them as well.

---

Signature

Date

*Note: Copies of the signed letter should be sent by the Lead Organization to the TCEQ NPS Project Manager within 30 days of the final TCEQ approval the QAPP. This letter should be submitted for all subcontractors that did not sign the QAPP (under section A1 of this QAPP).*