

**Arroyo Colorado Agricultural Nonpoint Source Assessment
FY 06 CWA 319(h)
TSSWCB Agreement No. 06-10-07-05**

Quarter no. 1 From 1/01/07 Through 3/31/07

I. Abstract

The contract for the Arroyo Colorado Agricultural Nonpoint Source Assessment Project (TSSWCB # 06-10-07-05) was signed during this quarter, which initiated discussion of project efforts and collaboration. An internal teleconference was held for TWRI, TAES, TAMUK personnel to review project scope of work, deliverables and planned activities for the upcoming quarters. The teleconference sparked discussion and provided for the initiation of several tasks. Administratively, subaccounts were set up for each task and the subcontract with TAMUK was drafted and should be finalized with signature during the next quarter. Looking forward to the second quarter of the project, TWRI anticipates hosting face-to-face meetings and drafting the project QAPP to allow for monitoring activities.

II. Overall Progress and Results by Task

TASK 1: Project Coordination and Administration

Subtask 1.1: TWRI will organize an Ag Monitoring Oversight Committee to coordinate project efforts with all project participants. This Committee will be composed of TAES, TAMUK, TCE, TCEQ, TDA, Texas Sea Grant, TSSWCB, Nueces River Authority, producer groups, irrigation districts, and drainage districts. This Committee will meet at least semi-annually to discuss project status, provide input on monitoring design, coordinate project activities, and coordinate monitoring efforts with educational activities.

The following actions have been completed during this reporting period:

- a. A draft list of the Ag Monitoring Oversight Committee members was developed as a result of the internal planning meeting on March 21, 2007. The draft list is included in Appendix A.
- b. Potential members of the oversight committee will be notified during the next quarter to determine their participation. It is the intent of TWRI to host a meeting of this committee in conjunction with Ag Workgroup meetings in May or June.

5% Complete

Subtask 1.2: TWRI will prepare electronic quarterly reports for submission to the TSSWCB. All progress reports will be provided to the Ag Monitoring Oversight Committee [Final report provided under Task 8].

The following actions have been completed during this reporting period:

- a. Submitted Year 1, Quarter 1 Report on April 13, 2007.

10% Complete

Subtask 1.3: Monitoring results will be transferred to TCE and TAES for development of educational materials and presentation to stakeholders. Based on the results of the monitoring, TCE will hold workshops demonstrating the impacts of implementing BMPs in the watershed and coordinate periodic meetings of ag producers to bring awareness concerning the impact of the drainage ditches on the mitigation of pollutants from the fields (the educational activities are funded under a FY05 project).

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 1.4: TWRI will attend meetings with the TSSWCB project manager and other meetings, as needed, to review project status, deliverables, etc. During quarters when no Ag Monitoring Oversight Committee are scheduled, TTVN meetings will be conducted with project participants to discuss project activities, project schedule, lines of responsibility, communication needs, and other requirements

The following actions have been completed during this reporting period:

- a. An internal meeting with all project participants was held on March 21, 2007. The purpose of the meeting was to reacquaint all project participants with the contract plan of work. Since it was simply an administrative organizational meeting, TWRI did not include TSSWCB on the discussion. Minutes from the meeting are included in Appendix B.
- b. If possible, a joint meeting with TSSWCB and all project participants will be scheduled for the next quarter.

10% Complete

Subtask 1.5: TWRI will participate in Arroyo Colorado Partnership and Arroyo Colorado Agricultural Issues Work Group Meetings.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 1.6: TWRI will submit appropriate Reimbursement Forms.

The following actions have been completed during this reporting period:

- a. Subaccounts for all subtasks were set up during this quarter. Personnel responsible for the subtasks received a subaccount award notice that included deliverables and budget information.
- b. The subcontract for TAMU-Kingsville (TEES) was also initiated during the first quarter. This subcontract should be initiated during the next quarter and the subaccount for TAMUK should be set up.

- c. Two separate budget requests were submitted during this quarter.
- The first budget request was for Dr. Juan Enciso, who initially budgeted for the purchase of a utility work vehicle. However in the time from budget development and project award, Dr. Enciso was able to purchase the utility vehicle with a separate project. The utility vehicle will still be used within this project and therefore, Dr. Enciso requested funds (\$6000) be moved from the equipment (capital outlay) category to the other direct category to allow for maintenance of the utility vehicle and purchase of a computer for project personnel.
 - The second budget request was for Dr. Srinivasan, who initially budgeted for the purchase of computer software to be used for project tasks. However, funds were allocated into the incorrect category (supplies) and purchase of computer software falls within the other direct category. Therefore, the budget request moves \$1000 from supplies into other direct.

10% Complete

Subtask 1.7: TWRI will develop (Months 1-3), host and maintain (Months 3-36) an internet website for the dissemination of information on educational, monitoring and demonstration activities taking place across the Arroyo Colorado watershed. Website delivery of information will be the most time and cost effective way to disseminate information to interested people or groups.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time

0% Complete

TASK 2: Compilation and Evaluation of Prior Studies and Data

Subtask 2.1: TWRI, with assistance from members of the Ag Monitoring Oversight Committee, will compile historical water quality data and information from previous studies and conduct a detailed analysis of the most significant water quality parameters to investigate the trends and the different biological and physical process taking place in the watershed that contribute to changes in water quality in the Arroyo

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 2.2: TWRI, with assistance from members of the Ag Monitoring Oversight Committee, will organize the results from the earlier non-point source pollution projects conducted in the Arroyo Colorado watershed and summarize the results and conclusions of these studies.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 2.3: TWRI, with assistance from members of the Ag Monitoring Oversight Committee, will identify critical data gaps that should be filled.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 2.4: TWRI will transfer results to TCE to be used to develop educational material through the FY05 Arroyo Education Project.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

TASK 3: Inventory Conservation Practice Implementation

Subtask 3.1: TAES-Temple, with assistance from TCE, USDA-NRCS, USDA-FSA, the TSSWCB Harlingen Regional Office, and the SWCDs, will identify all producers in the watershed.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 3.2: TAES-Temple, with assistance from TCE, USDA-NRCS, USDA-FSA, the TSSWCB Harlingen Regional Office, and the SWCDs, will compile information on the location and types of Conservation Practices implemented in the Arroyo Colorado Watershed since 1995. This will include, but not be limited to, practices implemented through the Environmental Quality Incentives Program (EQIP) and the Water Quality Management Plan (WQMP) Program.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 3.3: TAES-Temple will assemble a geo-referenced database and develop a map (hard copy and electronic) displaying conservation practice implementation information collected in Subtask 3.2.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 3.4: TAES-Temple will transfer the information from Subtask 3.1 and Subtask 3.3 to TCE for use in targeting educational activities.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 3.5: TAES-Temple will identify areas needing priority implementation work through correlation with Task 4 and the results from Tasks 6-9.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

TASK 4: Update Land Use/Land Cover Data

Subtask 4.1: The Spatial Sciences Lab (SSL) will obtain 1998 LULC for the Arroyo Colorado Watershed from TCEQ and all data used to produce it. Coordinate with TPWD and the Habitat Work Group to obtain relevant recent LULC data. Identify the major changes from 1998 to 2005.

The following actions have been completed during this reporting period:

- a. SSL obtained the TCEQ Land Use Map from TCEQ that was used for modeling.

33% Complete

Subtask 4.2: SSL will obtain 2003 LANDSAT ETM+ Data, Path 26/ Row 42 and Path 27/ Row 42. Proceed to image classification at a level equivalent to the MRLC classification to level 2.

The following actions have been completed during this reporting period:

- a. SSL has selected some of the satellite scenes and started the procedure for acquiring them.

25% Complete

Subtask 4.3: If available, SSL will obtain applicable digital data on cropland from USDA – FSA and add up to level 2 classification.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 4.4: If available, SSL will obtain digital location data on citrus production from USDA-APHIS and add up to level 2 classification.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 4.5: If available, SSL will obtain digital data on locations of sugarcane fields from sugar mill and add up to level 2 classification.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 4.6: SSL will obtain 2004 1m DOQ for Cameron, Hidalgo and Willacy counties. Improve the level 2 classification to a level 4 classification by manual digitalization.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 4.7: SSL will obtain most recent digital data from irrigation districts and add up to level 4 classification.

The following actions have been completed during this reporting period:

- a. SSL is working with Guy Fipps to acquire irrigation district boundaries and canal location GIS files for the project.

20% Complete

Subtask 4.8: SSL will obtain 1998 tile drainage data and if available, obtain updated data from TSSWCB and TCE.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 4.9: SSL will obtain 1998 data on colonia and if available, obtain updated data from TWDB. Superpose colonia data to level 4 classification.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 4.10: SSL will obtain 1998 data on non-colonia septic systems and if available, obtain updated data from Lower Rio Grande Valley Development Council (LRGVDC). Superpose non-colonia septic systems data to level 4 classification.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 4.11: SSL will obtain 1998 data on land Application and if available, obtain updated data from NPDES Permits. Superpose land application data to level 4 classification.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

TASK 5: Develop Quality Assurance Project Plan

Subtask 5.1: TWRI will develop a Quality Assurance Project Plan (QAPP) that will detail project goals and objectives relating to water quality monitoring activities; identify the data needed to fulfill those objectives; list field and laboratory methods; describe procedures and schedules to be followed; and specify a data management structure and the quality assurance protocols.

The following actions have been completed during this reporting period:

- a. TWRI presented the data needs (Appendix C) for development of the QAPP to all project participants during March. These needs were discussed during the March 21, 2007 meeting (Appendix B).
- b. Project monitoring participants (Task 6 and 7), TSSWCB Regional Manager (Andy Garza) and Drainage District Personnel (Alan Moore) met on March 29, 2007 to review and discuss potential monitoring sights within drainage ditches of the Arroyo Colorado. Minutes of their meeting are included in Appendix D.
- c. A list of standard methods and USEPA approved laboratory procedures for various water quality characteristics including BOD, TSS, TKN, Ammonia, Nitrate, Nitrite, Total Phosphorus, Soluble Reactive Phosphorus have been compiled. In some instances there is more than one acceptable procedure. Literature review is currently being undertaken to compare equivalent procedures and identify the final set of protocols to be listed in the QAPP.
- d. Work has been initiated by TWRI on QAPP development.

10% Complete

Subtask 5.2: TWRI will provide annual revisions and necessary amendments to the QAPP to the TSSWCB and EPA.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

**TASK 6: Perform Sub-Watershed Monitoring and Measure
Pollutant Attenuation in Drainage Ditches**

Subtask 6.1.1: TAMUK will perform routine monthly grab sampling at four drainage ditch sites. Water quality samples will be collected only if water is flowing. If water is not flowing when monthly sampling is scheduled, a water quality sample will not be collected, but it will be documented that the stream was pooled or dry. Routine grab samples will be analyzed for nutrients, TSS, and BOD. In addition, field constituents of dissolved oxygen, pH, conductivity, and water temperature will be recorded at the time grab samples are collected.

The following actions have been completed during this reporting period:

- a. Selection of drainage ditch sites were evaluated during the March 29 meeting of monitoring task personnel (Appendix D).
- b. During the meeting, it was noted that several drain tile outlets existed, which bring in discharges from the agricultural lands into the drainage ditches. In addition to this sub-surface flow, surface-runoff will be the other major source of pollutant loading, especially during rainstorm events. In addition to sampling at the outlet of the ditches for nutrients, sampling in select drains (especially the ones close to the outlet) will need to be performed to the extent possible to obtain estimates for pollutant loading and carry-out mass-balances. Volumetric approaches can be used to estimate flowrates from this drain pipes.

5% Complete

Subtask 6.1.2: TAMUK will periodically operate automated samplers and water-level recorders at all four drainage ditch sites to characterize the effects of run-off generated by high storm flow pulses. TAMUK will utilize existing raingage and remotely-sensed NEXRAD data to identify optimal periods for carrying out such sampling. Given the variable nature of the rainfall process, it is difficult to estimate the exact number of samples that will be obtained. However, attempts will be made to carryout at least one sampling campaign quarterly during the sampling period. At each drainage ditch site, individual runoff samples will be collected daily during storm events and flow composited into one sample that will be analyzed for nutrients, BOD, and TSS. Care will be taken to ensure that the data loggers are programmed to capture the effects of rainfall pulses and not respond to minor water level fluctuations caused due to irrigation flooding. The monthly water level data collected as part this task and unit hydrograph techniques will be used to identify the optimal response frequency to capture high-intensity rainfall pulses.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 6.1.3: Stage-discharge relationships will be developed, maintained and updated, as necessary, for all drainage ditch sites. This will include taking flow measurements and re-surveying stream cross-sections, if apparent changes have occurred.

The following actions have been completed during this reporting period:

- a. During the March 29 meeting, it was noted that measurement of flowrates could be somewhat problematic at some locations during high flow events. It is suggested that the flowrates during such events be obtained using an impeller type flowmeter, while more sophisticated electromagnetic flow meters (e.g., Marsh-McBirney Flo-Mate) be used to characterize low flow events.

5% Complete

Subtask 6.1.4: TAMUK will conduct routine general maintenance of all automated sampling and water level equipment to help ensure that these instruments will operate properly during storm flow conditions.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 6.1.5: TAMUK will develop a report summarizing the monitoring data.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 6.2.1: In coordination with the sub-watershed monitoring sites discussed in Task 6.1, TAMUK, with assistance from TAES, will assess nitrogen and phosphorous mitigation processes in drainage ditches.

The following actions have been completed during this reporting period:

- a. TAMUK developed a conceptual model for estimating attenuation in the ditches (Figure 1). The basic idea behind estimating effluent attenuation in the drainage ditch is depicted in Figure 1. The outlet loading ($Q_o C_o$) would provide an estimate of the amount of pollutant entering the Arroyo Colorado main channel. The attenuation of the nutrient can be ascertained by measuring other fluxes identified in conjunction with basic mass-balance equation. Note the non-point sources identified in Figure 1 could include both tile drain runoff and overland flow (if any). It is hypothesized that the nature and extent of attenuation will be chemical specific and exhibit spatio-temporal variability. The measured attenuation could be due to a variety of causes including – adsorption, biotic and abiotic degradation, settling and plant uptake.

5% Complete

Subtask 6.2.2: TAMUK, with assistance from TAES, will develop a suite of suitable BMPs that incorporates the information obtained from the investigation of agricultural drainage ditches described in Subtask 6.2.1 above.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

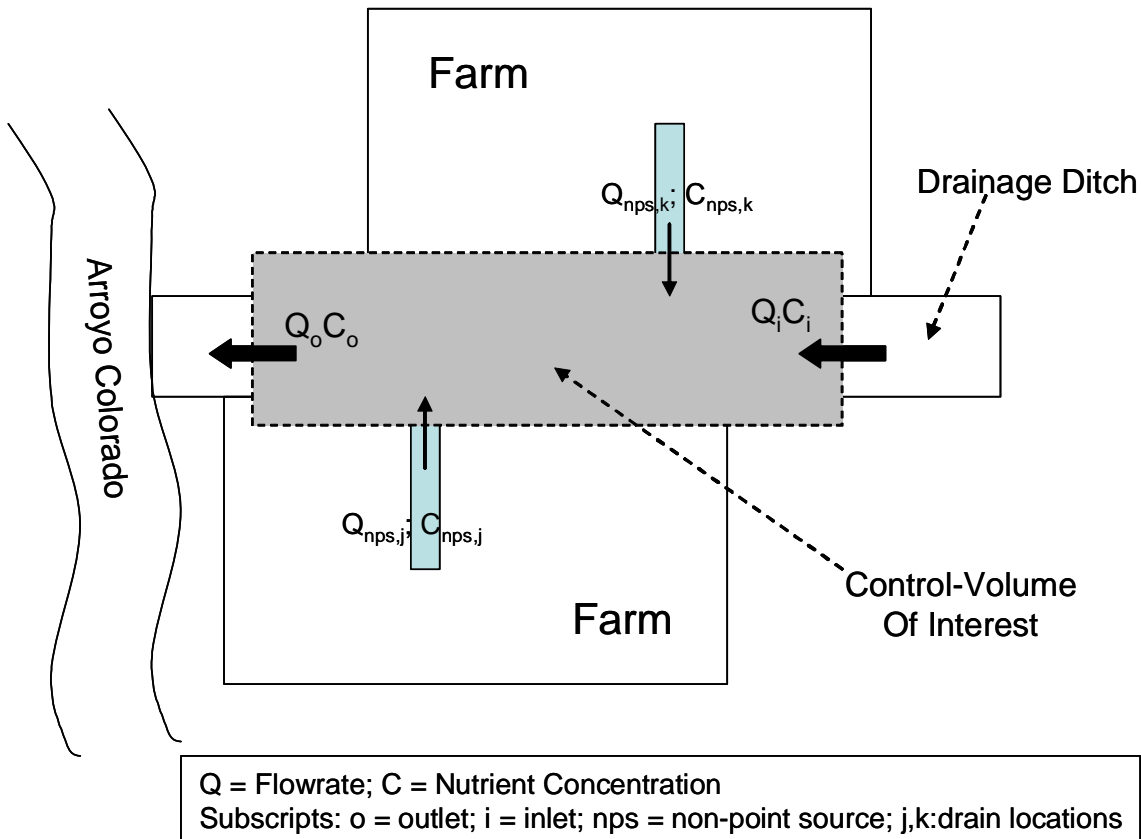


Figure 1: A Conceptual Model for Estimating Effluent Attenuation in Drainage Ditches

TASK 7: Evaluate BMPs to Reduce NPS Pollution at the Farm Level

Subtask 7.1: Selection of sites. Texas Cooperative Extension (TCE), Texas Agricultural Experiment Station-Weslaco (TAES-Weslaco), and Texas A&M University-Kingsville (TAMUK) will select suitable demonstration sites to assess loadings from agricultural runoff and leachate produced by different BMPs and compare traditional practices with innovative BMP for the three (3) most representative crops of the watershed. Six (6) representative sites will be characterized and physical characteristics of such as topography, soil texture, salinity and fertility levels, water quality and crops will be obtained and evaluated

The following actions have been completed during this reporting period:

- a. An assistant, Ms. Laura de la Garza, was hired by TAES-Weslaco to assist with selection of sites and to define some of the Best Management Practices. Duties of this position will include:
 - Assist in selecting demonstration sites to assess loadings from agricultural runoff.
 - Investigate water quality parameters that need to be evaluated in selected points and determine research labs where the samples can be sent.
 - Do a literature research of the effect of sediments on water quality parameters and the ecological practices that have been implemented to filter sediment loadings.
 - Assist in collection of water samples from demonstration sites to determine nutrient loadings and water quality parameters.
 - Identify soil conservation practices that can be implemented in the Arroyo Colorado.
- b. The monitoring team (TAES-Weslaco, TCE, TAMUK) met with TSSWCB and Cameron County Drainage District Personnel to determine site selection of monitoring drainage ditches (Appendix D). Monitoring task project personnel are trying to coordinate field sampling sites (BMP evaluation) with drainage ditch sites to the extent possible.

10% Complete

Subtask 7.2: Installation of sensors. Flow meters, rain gauges, piezometers, soil water sensors will be installed by TAES-Weslaco in the demonstration sites

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 7.3: Collection and analysis of Data. Runoff and leachate samples will be collected by TAES-Weslaco for the different practices and laboratory analyses will be performed to determine agricultural loadings such as nutrients and solutes. BMPs and traditional practices will be compared economically and their relationship with nutrient loadings will be established

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

Subtask 7.4: Field Days and Result Demonstrations. TCE will conduct one field day and one result demonstration per year to demonstrate and transfer the result to farmers and interested persons. Newspaper and communications media will be used to divulge the results

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

TASK 8: Develop Final Report

Subtask 8.1: TWRI, with assistance from TAES and TAMUK, will prepare final report for submittal to the TSSWCB.

The following actions have been completed during this reporting period:

- a. Nothing to report at this time.

0% Complete

III. Related Issues/Current Problems and Favorable of Unusual Developments

- None to report at this time

IV. Projected Work for Next Quarter

Task 1

- Potential members of the Ag Monitoring Oversight Committee will be notified during the next quarter to determine their participation. It is the intent of TWRI to host a meeting of this committee in conjunction with Ag Workgroup meetings in May or June.
- The subcontract with TAMUK (TEES) will be initiated.
- If possible, a joint meeting with TSSWCB and all project participants will be scheduled for the next quarter.

Task 3

- Coordinate BMP implementation (spatially and temporally) data collection and producer identification from appropriate agencies in conjunction with the upcoming Ag Workgroup meeting

Task 5

- A draft QAPP will be provided to project personnel for review.

Task 6

- Drainage ditch sites to be monitored will be selected.

Task 7

- Project personnel will define the BMPs that will be evaluated.

APPENDIX A

AG MONITORING OVERSIGHT COMMITTEE POTENTIAL MEMBERS

Agency	Position	Name	Phone	Email
TCEQ	Project Manager	Cory Horan	512.239.4026	choran@tceq.state.tx.us
	TMDL Project Manager	Roger Miranda	512.239.6278	rmiranda@tceq.state.tx.us
TDA		Richard Eyster	512.463.7426	richard.eyster@agr.state.tx.us
Nueces River Authority	Deputy Executive Director - Coastal Bend Division	Rocky Freund	361.825.3193	rfreund@nueces-ra.org
TCE	Hidalgo County Extension Agent Education Assistant	Brad Cowan	956.383.1026	bcowan@ag.tamu.edu
TWRI	Project Manager Arroyo Watershed Coordinator	Cecilia Wagner	979.458.1138	cecilia@tamu.edu
TSSWCB	Regional Office - Harlingen	Andy Garza	956.421.5841	agarza@tsswcb.state.tx.us
	State Office - Temple	Aaron Wendt	254.773.2250	awendt@tsswcb.state.tx.us
NRCS	Civil Engineer	Dean Santistevan	956.383.3002	dean.santistevan@tx.usda.gov
Producer Groups	Texas Citrus Mutual	Ray Prewett	956.458.1616	rprewett@sbcglobal.net
	W.R. Cowley Sugar House / RGV Sugar Growers	Steve Bearden	956.636.1411	sbearden@rgvsugar.com
	Cotton Growers Producers	Sam Simmons	512.476.3913	
Irrigation & Drainage Districts	Harlingen Irrigation District Cameron County #1	Wayne Halbert	956.423.7015	waynehalbert@hidcc1.org
	Hidalgo and Cameron County Irrigation District #9	JoJo White	956.565.2411	hccid9@hotmail.com
	Cameron County Drainage District #5	Alan Moore	956.423.4671	alan@hidcc1.org

APPENDIX B

ARROYO AG NPS ASSESSMENT PROJECT MARCH 21, 2007

PARTICIPANTS

B.L. Harris	TWRI
Kevin Wagner	TWRI
Cecilia Wagner	TWRI
Juan Enciso	TAES (Weslaco)
Laura DeLa Garza	TAES (Weslaco)
Venki Uddameri	TAMUK
Srini	SSL
Wes Rosenthal	TAES (Temple)
Narayanan Kannan	TAES (Temple)

AGENDA

1. Project Management
2. Review Work Plan Tasks
 - a. Deliverables
 - b. Reporting
 - c. Budget Allocations & Budget Amendments
3. Monitoring Oversight Committee (Semi-annual)
 - a. Possible Members
 - b. First Meeting – early May
4. QAPP
 - a. Information needed
 - b. Amendments
5. Questions/Discussion

MINUTES

1. Project Management:

Over the next 6 months, Cecilia will be transitioning into the project management role for this and all related Arroyo Projects

2. Project Work Plan and Tasks

Task 1 – TWRI (Coordinate and administer project)

- Ag Monitoring Oversight Committee (semi-annual meeting)
- Quarterly Reports
- Transfer information to Extension for education purposes
- TTVN Meetings with project participants (alternating quarters of Ag Monitoring Oversight Committee)
- Participate in Arroyo Colorado Partnership Meetings
- Submit reimbursement forms
- Develop a Website (coordinate all Arroyo Projects within one Website)

Task 2 – TWRI (compile & evaluate prior studies/data)

- Compile historical water quality data
- Organize results from previous NPS projects
- Assess data gaps
- Develop report & transfer information to Extension for education purposes

Task 3 – TAES Temple (develop map of implemented conservation practices)

- Identify all producers within watershed
- Compile information on location & types of conservation practices implemented
- Develop geo-referenced database & develop a map
- Transfer information to Extension for education purposes
- Identify areas needing implementation

Task 4 – SSL (Update LULC Data)

-

Task 5 – TWRI (develop QAPP)

- Develop QAPP
- Update QAPP annually and as necessary

Task 6 – TAMUK (Perform sub-watershed monitoring)

- Routine grab samples at the 4 sites identified by Andy Garza
- Operate automated samplers
 - *TAMUK planning on reviewing all sites within next 2 weeks to check on sites*
- Stage discharge relationships
- Summary report
- Determine pollutant assimilation in drainage districts & describe mitigation effects of drainage districts
- Develop a suite of BMPs

Task 7 – TAES Weslaco (Evaluate BMPs at edge of field)

- Select & assess 6 sites (3 crops: grain sorghum, cotton, sugarcane; management practices: land leveled, contour tillage) But how do we do side by side comparison in the field?
 - *Will work with Uddameri & CEAs to try to finalize selection of sites*
- Install sensors, gauges, flow meters, etc.
- Collect & analyze data
 - *Run through Uddameri's lab*

- Conduct field days & results demonstrations
 - *Hold in conjunction with ADI Project – work with Brad & Enrique*
- Develop Result Demonstration Report & Fact Sheet

Task 8 – TWRI (Final Report)

- Develop & Submit Final Report

Schedule of Deliverables

- See handout from Kevin
- First Quarterly Report due 4/15/07
- TWRI project manager will request information around beginning of month & submit report to TSSWCB

3. Monitoring Oversight Committee

MEMBERS

- TCEQ (Cory and/or Roger)
- TDA (Richard Eyster)
- Nueces River Authority (Rocky Freund)
- TCE (Brad Cowan/Education position)
- TWRI (project manager & watershed coordinator)
- TSSWCB (Andy Garza and Aaron Wendt/Laurie Fleet)
- NRCS (Dean Santistevan)
- Producer Groups (Ray Prewett and/or Steve Bearden and/or Sam Simmons)
- Irrigation Districts (Wayne Halbert)
- Drainage Districts (JoJo White and/or Allan Moore)

PURPOSE/SCHEDULE

- Advisory purpose for selection of sites; data collection; monitoring; summary reports;
- First Meeting – early May (review draft QAPP at this meeting)

4. QAPP

- See handout from Kevin

5. Questions/Discussions

- TWRI will follow up with Ag Monitoring Oversight Committee names & setting up initial meeting
- TWRI will follow up example QAPPs
- Once TWRI receives QAPP information from each project participant, TWRI will draft QAPP & send to all for review

APPENDIX C

INFORMATION NEEDED FOR QAPP DEVELOPMENT

State the goal(s) of your monitoring

Summarize work to be performed, measurements to be made, sites to be evaluated, and data files to be obtained to support the project's goals

Describe sampling design

- Detail type, sampling frequency, and total number of samples expected
- Indicate where samples are to be taken and how sites identified
- Outline sampling methods
- Indicate what sample containers and sample volumes should be used
- Identify whether samples should be preserved and if so, how
- Identify sampling equipment used

Describe Analytical Methods

- Identify EPA or Standard Method to be used
- Identify equipment needed for analysis
- Describe quality control measures to be used (i.e. blanks, spikes, duplicates) and frequency of their use
- Identify what lab will perform analysis and who is the lab manager and who is responsible for quality assurance

Describe how data will be managed from field to final use and storage including what software will be used and who will be responsible for data management

APPENDIX D

ARROYO AG NPS ASSESSMENT PROJECT FIELD TOUR – THE PROPOSED DRAINAGE DITCHES TO BE MONITORED MARCH 29, 2007

PARTICIPANTS

Andy Garza	TSSWCB
Alan Moore	Cameron County Drainage District 5
Juan Enciso	TAES (Weslaco)
Xavier Peries	TAES (Weslaco)
Laura DeLa Garza	TAES (Weslaco)
Venki Uddameri	TAMUK
Annette Hernandez	TAMUK
Brad Cowan	TCE (Weslaco)
Enrique Perez	TCE (Weslaco)

MEETING PURPOSE

The purpose of the meeting was to familiarize project participants with the four (4) proposed drainage ditches to be monitored under Task 6 of the Arroyo Ag NPS Assessment Project and to continue discussions on BMP and site selection for Task 7.

MINUTES

The meeting participants gathered at offices of Andy Garza, TSSWCB, at 9:15 a.m. A pre-site tour meeting was held in his office to review the purpose of the field tour. Laura review Tasks 6 and 7.

In relation to Task 6:

The four (4) proposed drainage ditches discharge directly into the Arroyo Colorado. The access locations identified were very close, i.e., typically less than 100 ft from the main channel of the river. As such, these sites were deemed very suitable for assessing agricultural non-point source loadings into the Arroyo Colorado.

In addition to preliminary visual inspection, the locations were geo-coded with a GPS unit. Initial inspection revealed that all sites were readily accessible and would pose little difficulties with regards accessibility and the ability to collect routine grab samples as described in the workplan. However, measurement of flowrates could be somewhat problematic at some locations during high flow events. It is suggested that the flowrates during such events be obtained using an impeller type flowmeter, while more sophisticated electromagnetic flow meters (e.g., Marsh-McBirney Flo-Mate) be used to characterize low flow events.

Several drain tile outlets were noted along the drainage ditches surveyed which bring in discharges from the agricultural lands into the drainage ditches. In addition to this sub-surface flow, surface-runoff will be the other major source of pollutant loading, especially during rainstorm events. In addition to sampling at the outlet of the ditches for nutrients, sampling in select drains (especially the ones close to the outlet) will need to be performed to the extent possible to obtain estimates for pollutant loading and carry-out mass-balances. Volumetric approaches can be used to estimate flowrates from this drain pipes.

In relation to Task 7:

Dr. Encsio asked if sites outside the Arroyo Colorado watershed proper, but within the North Floodway watershed, could be used in the study. Andy Garza said no, that we should stay within the boundaries of the Arroyo watershed.

The group discussed possible BMPs that could be evaluated under Task 7. The group agreed that efforts should be concentrate on irrigation best management practices and on residue management/conservation tillage.

Laura asked the group to be thinking about the monitoring design and data gaps as we proceed to the field sites.

Site No. 1 – Harding Ranch Road off CO Roads 508 and 1420 in Cameron County

- Andy showed the group a map of the sub-watershed showing the drainage area.
- Alan Moore said that this was ditch was within jurisdiction of Wayne Halbert, Harlingen Irrigation District Cameron County No. 1.
- Andy said that both irrigated and non-irrigated ag fields drained into this ditch and that it also had a number of tile drains flowing into it.
- Dr. Uddameri said he would come back with a GPS unit to locate all inputs.
- All agreed that this was a good site for the study.
- Andy led the group (by car) along the path of the drainage ditch to get a better sense of the area.



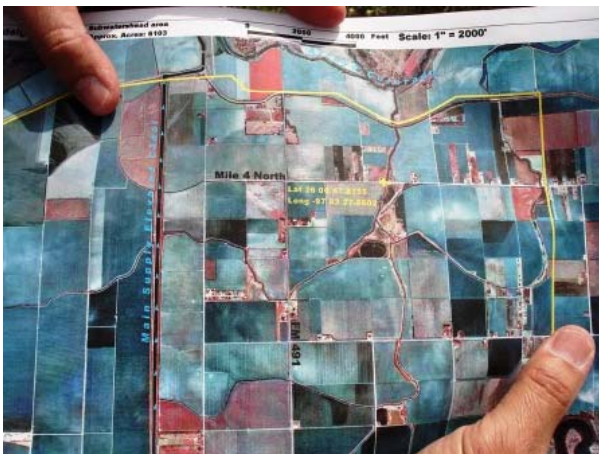
Site No. 2 – ABD Road and FM 1479 (Rangerville Road, Harlingen, Texas)

- Andy showed the group a map of the sub-watershed showing the drainage area.
- Alan Moore said that this was ditch was within jurisdiction of Wayne Halbert, Harlingen Irrigation District Cameron County No. 1.
- Dr. Enciso said he had some existing irrigation studies ongoing in the area that they were already working with local farmers raising cotton and sorghum.
- All agreed that this was a good site for the study.



Site No. 3 – Mile 4 North FM 491 Southeast of Mercedes, Texas

- Andy showed the group a map of the sub-watershed showing the drainage area.
- Alan Moore said that this was ditch was within jurisdiction of the drainage district managed by JoJo White.
- Very steep slopes were noted.
- Dr. Uddameri said that this would be a difficult site to monitor storm water flows and that those event flows would have to be estimated.
- All agreed that this was a good site for the study.





Site No. 4 – Off FM 493, 3 miles North US Military Highway 281

- Andy showed the group a map of the sub-watershed showing the drainage area.
- Alan Moore said that this was ditch was within jurisdiction of the Donna Drainage District.
- Alan said that this drainage ditch and the one off FM 491 are examples of drainage ditches that are not regularly mowed because of budget constraints; that these ditches might be mowed once per year.
- Dr. Uddameri said that this would be relatively easy to monitor.
- All agreed that this was a good site for the study.





In closing, Andy Garza said that he would provide copies of all his maps to Dr. Uddameri and Dr. Enciso. Laura said that she would get back in touch with the group next week to continue discussions on the proposed sites to be monitored under Task 7. Dr. Uddameri will provide Dr. Enciso the costs for doing water quality analysis in his lab.