A Watershed Protection Plan for the Arroyo Colorado Phase I

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Arroyo Colorado Watershed Partnership
We All Live In A Watershed
Rio Grande Watershed

• The Rio Grande is the major source of water to Valley Residents.

• Inter-basin transfer of water.

• There is a need to work with Mexico on water issues.
Nueces-Rio Grande Basin aka The Lower Laguna Madre Watershed
The Arroyo Colorado Watershed
Arroyo Colorado Watershed

- 706 square miles
- 500,000 acres
- 333,000 agricultural land
- 90 miles long
- 41 rare and endangered species
- 10 cities with 10,000+ people and growing
The Arroyo Colorado Serves the Lower Rio Grande Valley
Primary Source of Fresh Water for the Lower Laguna Madre
Receives treated wastewater, storm water runoff, excess irrigation
Helps control flooding and drainage
Carries commercial barge traffic
Provides sanctuary for birds
Many recreational benefits
A nursery for many fish and shrimp species
Arroyo Colorado Impairments & Concerns

- High Levels of Bacteria
- Failing septic systems
- Untreated or under-treated wastewater effluent
- Animal waste
Arroyo Colorado Impairments & Concerns

- Low Levels of Dissolved Oxygen
  - Nutrient loadings
  - Physical characteristics
Percent of Impaired Waters - 1998 (Updated February 2000)

No Waters Listed
< 5%
5 - 10%
10 - 25%
> 25%
Causes of Impairments in Texas Rivers and Streams

- Metals
- Selenium
- Cadmium
- Dioxins
- Mercury
- Lead
- Water Temperature
- Unknown Toxicity
- Priority Organics
- pH
- TDS/Chloride/Sulfide
- Depressed Dissolved
- Pathogens

Percentage of Affected Stream and River Miles
Multiple Uses.
Many Consequences.
Sources of Nutrient Loading

• Wastewater treatment plants
• Agricultural runoff
• Urban storm water runoff
Wastewater Discharge

- 18 large wastewater treatment plants
- Point source discharges
- Nutrients contribute to algae blooms
- Bacteria and fecal pathogens
Agriculture

- More than 50% watershed land
- Fertilizers and soil
- Algae blooms
- Depletion of available oxygen
Urban

- Fast growing urban population
- Fertilizers and bacteria from parks and lawns
- Nutrients contribute to algae blooms
- Bacteria and fecal pathogens in runoff
- Litter
Navigation

- Dredging alters habitat
- Adds excess soil to the streambed
- Spoil material on banks reduce natural aeration process
Flood Control

- Physical changes to carry floodwaters
- Routine clearing of plant life
- No vegetation to stabilize soil, filter contaminants, offer habitat
Cumulative Effects On The Lower Laguna Madre
Fish Need Oxygen to Live
State Investigation.
Community Response.
Arroyo Colorado Watershed Partnership

- Over 500 individuals representing stakeholder groups
- 25-member Steering Committee coordinating overall effort
- 7 work groups focused on specific issues
- 49 meetings over 2 ½ years
Arroyo Colorado Watershed Protection Plan

- Causes and sources
- Load reduction
- NPS management measures
- Technical and financial assistance
- Information & education
Arroyo Colorado Watershed Protection Plan

- Implementation schedule
- Milestones
- Assessing load reduction
- Water quality monitoring
Mission Statement

“Reduce the additions of pollutants to the Arroyo Colorado to the maximum extent possible in order to meet state water quality standards and improve the natural terrestrial, riparian, and aquatic habitat associated with the Arroyo Colorado Watershed”
Constructed Wetlands: Top Priority!

- Habitat for fish and other aquatic species
- Stabilize streambeds and banks
- Filter and process contaminants
How Wetlands Work

- Total Suspended Solids
- Nitrogen
- Phosphorus

Inflow → Outflow
Wetlands: Before/After
Wetlands Do Work!
Additional Plan Strategies

- New/improved wastewater collection systems & treatment facilities
- Agricultural BMPs
- Modified drainage maintenance practices
- Public outreach on water quality issues & impacts
Agricultural Plan Component

The Goal:

Encourage the voluntary adoption of BMPs to reduce suspended solids from cropland erosion, BOD from crop residue, and nitrogen and phosphorus fertilizer runoff from irrigated and non-irrigated cropland fields.
Ag Measures

• Technical assistance to develop individual farm plans.

• Cost share assistance pay for the practices included in their individual farm plans.

• Education programs to keep farmers current on proper BMPs.
Ag Measures

- Assess agriculture’s contribution to the nutrient loadings to the Arroyo Colorado.

- Evaluate and demonstrate the benefits of BMP implementation.

- Measure progress using GIS data management system.
State and Federal Cost Share for Voluntary Adoption of:

- Resource Management Systems (RMS)
- Water Quality Management Programs (WQMPs)
Cost Share Assistance Provided by:

- CWA Section 319(h) Grant funds - EPA and TCEQ
- SB503 Program - TSSWCB
- EQIP (Environmental Quality Incentives Program) - NRCS
- Section 6217 Program – EPA Coastal NPS Pollution Control Program
Priority BMPs covered by the TSSWCB and USDA programs for Targeted Arroyo Colorado Watershed protection include:
Nutrient Management
Irrigation Land Leveling
Irrigation Water Management and Systems
Conservation Crop Rotation
Irrigation Tail Water Recovery
Residue Management
Subsurface Drain
Filter Strip
Pasture and Hay Planting
Pest Management

Pest management utilizing environmentally sensitive prevention, avoidance, monitoring and suppression strategies to manage, weeds, insects, diseases, and animals that cause damage or annoyance.
Goals

• 33% of irrigated cropland (~100,000 ac) under management plan by 2010

• 50% of irrigated cropland (~150,000 ac) under management plan by 2015

• Currently ~61,000 irrigated acres are using BMPs
Ag NPS Assessment

- Complete historical data review of water quality and ag BMPs
- Investigate water quality variation in ag drainage ditches
- Collect data to better estimate ag NPS loading to Arroyo Colorado
Evaluation of mitigation effects of drainage ditches
Demonstration of Irrigation BMPs Effectiveness in Reducing NPS
Arroyo Colorado

To Weslaco

To Progresso

Flow Direction

Drain Tile Outlet
Sampling #2

Tail Water Runoff Ditch

Poly-Pipe

Flume Placement
Sampling #3

Furrow Irrigated
Sorghum 34 ac.
2202-FE

Harlingen Clay &
Runn Silty Clay

Alfalfa Valve (Water Source)
Sampling #1

Furrow Irrigated
Sorghum 2202-FE

To Progresso

Poly-Pipe

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Water Quality Analysis

- Field parameters (Temp, pH, conductivity, DO)
- Total phosphorus
- Dissolved orthophosphate phosphorus
- Total Kjeldahl nitrogen
- Dissolved ammonia
- Dissolved nitrite plus nitrate
- BOD5, and
- Total suspended sediments
Information and Education Component

- Texas Cooperative Extension
  - BMP Education
  - Meetings
  - Promotional Events
  - Newspaper
  - Newsletters
Ag Measures - Description of Milestones

- Number of producers with WQMPs
- Number of acres of farmlands using nutrient management
- Irrigation improvements
- Acres leveled
- Number of soil samples collected for nutrient management
ACWPP Estimated Pollutant Loading Reductions By 2015

Average Reduction = approx. 15%

- Biological Oxygen Demand – 404 tons/yr (10%)
- Total Nitrogen – 231 tons/yr (11%)
- Total Phosphorus – 22 tons/yr (13%)
- Suspended Sediment – 15,315 tons/yr (19%)
Estimated Amount of Technical and Financial Assistance Required

- 12 Million (2005-2010) Ag
- 13 Million (2011-2015) Ag
- 36 Million (2006-2010) Wastewater
- 20 Million (2011-2015) Wastewater

Total of approximately $80 Million needed in next 10 years to gain an average 15% reduction in nutrient loading
Criteria for verifying and assessing load reduction

• Water quality monitoring
  • In-stream monitoring of AC at 12 sub-basin sites
  • Treatment systems before and after treatment
• Above tidal biodiversity assessment
• Tidal biodiversity assessment
• Tidal dissolved oxygen assessment
• # of occurrence of fish kills
What can you do?

• Get acquainted with the Arroyo Colorado in your community
• Ask elected officials to address pollution issues
• Support repair or replacement of wastewater treatment facilities
• Support storm drain “stenciling”
What can you do?

- Don’t tolerate littering
- Volunteer
- Sign up for Arroyo Colorado bi-monthly updates
- Become a part of the AC Watershed Partnership

www.ArroyoColorado.org
What can you do?

- Report Fish Kills (281) 842-8100
- Report Suspicious Releases to Waterways (956) 571-3608
- Report Illegal Dumping to Hidalgo County Sheriff Office

www.ArroyoColorado.org
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