Improving Water Quality in the Arroyo Colorado

Surveying Recreational Uses

In the freshwater portion of the Arroyo Colorado, upstream of tidal influence (Segment 2202), fecal bacteria levels are occasionally elevated. This poses a possible risk to people who swim or wade in the tidal area of the stream—activities referred to as "contact recreation use" in the Texas Surface Water Quality Standards.

Fecal bacteria are commonly found in the intestines of warm-blooded organisms such as humans, livestock, wildlife, and pets. Certain types of bacteria in water may indicate the presence of disease-causing microorganisms.

In response to these conditions, the TCEQ Total Maximum Daily Load (TMDL) Program initiated a project to survey the recreational uses of Segment 2202. During this project, personnel collected:

- Information about the presence or absence of water recreation activities, stream flow, and stream depth.
- Data about other physical conditions necessary for safe contact recreation.

The TCEQ Standards Group used the data collected in this survey to complete a recreational use attainability analysis (RUAA). RUAA procedures are standardized to ensure that each analysis is based on sound and repeatable scientific methods.

Learn more about standards, monitoring, and TMDLs by reading Preserving and Improving Water Quality[1], available on our website and in print.

Description of the Arroyo Colorado

The Arroyo Colorado, a distributary channel of the Rio Grande, extends about 90 miles from Mission, Texas, to the Laguna Madre in the Lower Rio Grande Valley. The Arroyo Colorado is the major source of fresh water to the lower Laguna Madre, an economically and ecologically important resource to the region.

The Laguna Atascosa National Wildlife Refuge and several county and city parks are located within the Arroyo Colorado watershed. One third of the stream is also used for shipping from the Gulf Intracoastal Waterway to the Port of Harlingen.

[1] https://www.tceq.texas.gov/publications/gi/gi-351

Flow in the Arroyo Colorado is sustained by wastewater discharges, agricultural irrigation return flows, urban runoff, and base flows from shallow groundwater. Although an integral part of a major floodway system, water is rarely directly diverted from the Rio Grande into the Arroyo Colorado; direct diversions occur only during major flood events.

The watershed, with 1,828 square kilometers, is part of the larger Nueces–Rio Grande Coastal Basin. The Arroyo watershed is a flat coastal plain that slopes gently toward the Gulf of Mexico. The fertile farmland, long growing season, and irrigation water from the Rio Grande make this region one of the most productive agricultural areas in the U.S. The mild climate, semi-tropical plants and animals, and many recreational opportunities draw large numbers of people to the Arroyo Colorado watershed.

Project Development

The Nueces River Authority (NRA) partnered with TCEQ to conduct the survey. The study's sampling plan was shared with the public, and residents were given the opportunity to modify the sampling plan based on their local knowledge and expertise. This

collaboration ensured that the study collected and assessed samples from the most appropriate sites.

NRA conducted basic recreational use attainability surveys in May of 2010 and April 2011. In September of 2011, NRA submitted its Comprehensive Recreational Use Attainability Analysis Report to TCEQ. After reviewing the report and the information collected during the surveys, TCEQ requested that the NRA collect additional information to support its recommendation on the most appropriate recreational use classification for the segment.

The Arroyo Colorado survey was finished when the final report was submitted to TCEQ's Standards Work Group in May 2012. The analysis was reviewed by the Standards Work Group, which found that the primary contact recreation use for the Arroyo Colorado should be retained.

Public Participation

In all its projects, the TCEQ seeks to gather opinion and information from people who represent government, permitted facilities, agriculture, business, environmental, and community and private interests in the watershed.

Local participation was crucial in identifying the locations most used for contact recreation. Local water quality experts and users alike provided advice and feedback prior to and during the study.

For More Information

To learn more about the survey project, visit the TMDL project webpage:

www.tceq.texas.gov/waterquality/tmdl/87-arroyobacteria.html

Or contact:

TCEQ TMDL Program
512-239-6682, tmdl@tceq.texas.gov

To learn more about the final TCEQ recommendations regarding the appropriate recreational use category, see the Standards Group webpage at:

www.tceq.texas.gov/waterquality/standards/ruaas/arroyocolorado2202.

Or contact:

TCEQ Standards Program
512-239-6682, standards@tceq.texas.gov

Project Dates

Start Date: May 2010
End Date: May 2012

Project Highlights

- TCEQ and NRA held a public meeting in April 2010 to introduce the project to regional stakeholders and ask their advice about the survey.
- NRA conducted basic recreational use attainability surveys in May 2010 and April 2011, conducted interviews of knowledgeable persons, and collected historical information about recreational activities in the Arroyo Colorado Above Tidal watershed.
- NRA presented the results of the monitoring to stakeholders at public meetings in July 2010 and July 2011.
- In September 2011, NRA submitted a draft Comprehensive RUAA Report to TCEQ's TMDL Program. After reviewing the report and the information collected during the surveys, TCEQ requested that NRA collect additional information.
- NRA collected additional information in fall of 2011 and spring of 2012.
- NRA and the TMDL Program submitted the final Arroyo Colorado RUAA report in May 2012 to the Standards Group, which found that the primary contact recreation use for the Arroyo Colorado should be retained.
- Stakeholders in the Arroyo Colorado Watershed Partnership have developed a Watershed Protection Plan that aims at reducing bacteria, along with addressing low dissolved oxygen concentrations and associated parameters.