Improving Water Quality in South Central Texas

TMDLs for Bacteria and Dissolved Oxygen in Elm and Sandies Creeks

In 2002, assessment by the TCEQ showed that in Elm and Sandies Creeks, dissolved oxygen levels were lower than required to provide an optimal environment for aquatic life. In addition, bacteria concentrations were sometimes elevated, indicating a possible health risk for people who swim or wade in them—activities called "contact recreation" in the state's Texas Surface Water Quality Standards.

Oxygen gas, which dissolves in water, is essential for the survival of aquatic life. While the amount of dissolved oxygen in water fluctuates naturally, various human activities can cause unusually or chronically low dissolved oxygen levels, which may harm fish and other aquatic organisms.

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

In November 2004, the TMDL Program found, after additional assessment, that high bacteria and low dissolved oxygen were chronic conditions in the creeks.

The contact recreation and aquatic life uses currently designated for the creeks are presumed, not based on site-specific characteristics. After considering results from the TMDL Program's analysis, the TCEQ and area stakeholders decided there should be additional studies of the creeks to verify whether it would be necessary to develop and implement TMDLs.

The TCEQ Standards Group plans to complete recreational use attainability analyses (RUAAs) and aquatic life use attainability analysis (ALUAAs) for both Elm and Sandies creeks. Use attainability analyses (UAAs) assess the physical, chemical, and biological factors that determine whether a particular use is attainable in a particular water body.

Through development of the RUAA, project staff will survey how people actually use the stream for recreation, and evaluate stream characteristics that inhibit or promote water recreation. Similarly, staff will use the ALUAA to evaluate characteristics that influence the stream's suitability for aquatic habitat.

Depending on the results of these UAAs, the recreational and aquatic life use standards for Elm and Sandies creeks may be modified. If the Standards Team finds the current standards to be appropriate, the TCEQ will then consider development of TMDLs.

Learn more about water quality standards, monitoring, and TMDLs by reading *Preserving and Improving Water Quality*, available on our website at <www.tceq.texas.gov/waterquality/tmdl/>.

Project Watersheds

Elm Creek (Segment 1803A) originates west of Nixon in the eastern part of Wilson County, near the intersection of Wilson, Gonzales, and Karnes Counties. The stream flows eastward for approximately 24 miles. It converges with Sandies Creek just west of the Sandies' crossing with FM 1116. Although Elm Creek flows past the southern outskirts of Smiley, it is essentially a rural waterway. The watershed is characterized by flat to rolling terrain dominated by hardwoods, pines, mesquite, and a variety of grasses.

Sandies Creek (Segment 1803B) originates in southwestern Guadalupe County northwest of Smiley. The stream flows generally southeastward for approximately 65 miles until it joins with the Guadalupe River just west of Cuero in DeWitt County. Sandies Creek is essentially rural, though it flows past the northern outskirts of Smiley and through the community of Westhoff. Like the watershed of Elm Creek, hardwoods, pines, mesquite, and a variety of grasses dominate the flat to rolling terrain around Sandies Creek.

Project Development

The TCEQ contracted with the Texas Institute for Applied Environmental Research (TIAER) to gather and analyze data for the Elm and Sandies Creek Watersheds. Monitoring of instream conditions began in the summer of 2002 and continued through August 2004. The data analysis indicated that the impaired conditions were chronic.

In January 2009, the TCEQ and stakeholders decided the TCEQ should analyze whether the criteria associated with the aquatic life and contact recreation uses assigned to the creeks were attainable. No TMDLs were developed.

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.

TIAER coordinated public involvement in the project on behalf of the TMDL Program. The TCEQ also encouraged local involvement with the help of the existing Basin Steering Committee established for the Clean Rivers Program.

The TCEQ Standards Group will coordinate public participation in development of the UAAs.

For More Information

Contact one of the people listed below, or visit the project website at:

<www.tceq.texas.gov/waterquality/tmdl/31-elmsandies.html>

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Project Development

Start: November 2004
Project End: TMDL work ended January 2009

Project Highlights

- In January 2009, the TCEQ and stakeholders decided the TCEQ should analyze whether the criteria associated with the aquatic life and contact recreation uses assigned to the creeks were attainable. No TMDLs were developed.
- The Standards Group initiated the ALUAA in spring 2012 to evaluate the appropriate aquatic life uses and dissolved oxygen criteria. Data indicate that neither stream meets the average or minimum criteria for dissolved oxygen, and suggest that Sandies Creek is intermittent towards its headwaters.
- The TSSWCB is working in the Elm and Sandies Creek is to address agricultural sources of pollutants through voluntary implementation of best management practices by private landowners. Conservation partnerships have been developed that include SWCDs, TSSWCB, and NRCS.
- Technical Assistance for cattlemen and poultry growers is available to develop and implement WQMPs (Water Quality Management Plans). Financial assistance is also available through TSSWCB's EQIP. Education programs are being developed by AgriLife Extension.