



*Improving Water Quality in Matagorda Bay/Powderhorn Lake,
Tres Palacios Bay/Turtle Bay, Carancahua Bay and Conn Brown Harbor*

A TMDL Project for Dissolved Oxygen and pH

Water Quality

The state of Texas requires water quality in Matagorda Bay/Powderhorn Lake (Segment 2451), Tres Palacios/Turtle Bay (Segment 2452), and Carancahua Bay (Segment 2456) to be suitable for exceptional aquatic life, contact recreation, and the harvest and consumption of fish and oysters. Water quality in Conn Brown Harbor (Segment 2483A) must be suitable for intermediate aquatic life use, contact recreation, and the consumption of fish. Preliminary water quality testing found that prior to 2004:

- (1) dissolved oxygen concentrations were occasionally lower than the criterion established to assure optimum conditions for aquatic life in Matagorda Bay/Powderhorn Lake, Tres Palacios Bay/Turtle Bay, and Conn Brown Harbor
- (2) pH levels in Carancahua Bay appeared to be higher than the criterion established for general uses, and
- (3) bacteria levels exceeded criteria established for the harvest of oysters in all segments except Conn Brown Harbor.

In response to these conditions, a Total Maximum Daily Load (TMDL) project was initiated to confirm the impairments, determine the extent and severity of the low dissolved oxygen and high pH values and to determine the measures necessary to restore water quality in these bays and harbor. The bacteria impairment associated with the harvesting of oysters was not included as part of this project and will be addressed in a subsequent project.

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. The pH values for water bodies are equally important to the survival of aquatic life since all biological processes are dependent on pH. pH is a measure of the hydrogen ion activity in a solution. pH values not within the range of the criterion (between 6.5 and 9.0 SU) are an indicator that there may be inputs to the system causing the water to become unbalanced (i.e. too acidic or basic) and could cause harm to aquatic organisms.

The goal of a TMDL is to determine the amount (or load) of a pollutant that a body of water can receive



and still support its designated uses. The load is then allocated among all the potential sources of a pollutant within the watershed and measures to reduce the load are developed as appropriate.

Learn more about water quality standards and monitoring by reading *Clean Water for Texas: Working Together for Water Quality*, available on the Web at www.tceq.org/goto/tmdl/.

Description of the Watersheds

The segments included as part of this project lie within two distinct coastal basins, the Colorado-Lavaca and the San Antonio-Nueces basins. Matagorda Bay/Powderhorn Lake, Tres Palacios Bay/Turtle Bay, and Carancahua Bay are all located within the Colorado-Lavaca Coastal Basin. This basin covers 939 square miles and is located in the coastal plain between the Colorado and Lavaca Rivers. Tres Palacios Creek is the primary source of freshwater to this area. Conn Brown Harbor lies within the San Antonio-Nueces Coastal Basin. This basin drains a 2,652 square mile area and lies in the coastal plain between the San Antonio and Nueces Rivers. The primary sources of freshwater to this area are two minor rivers, the Mission River and the Aransas River.

The Colorado-Lavaca Coastal Basin includes portions of Matagorda, Wharton, Jackson, and Calhoun

counties. Major cities within this basin include Palacios, Point Comfort, and La Ward. The San Antonio-Nueces Coastal Basin includes portions of Aransas, Refugio, Goliad, Bee, and San Patricio counties. Major cities within this basin include Rockport, Refugio, Ingleside, Aransas Pass, Beeville, Portland, Sinton, Taft, and Bayside.

These areas represent an ecologically important part of the Texas coast that includes both freshwater and saltwater marshes along with open estuaries. They are home to a diverse assemblage of flora and fauna, including several species of shrimp, fish, crabs, and oysters which are coveted by commercial and sport fisherman. The quality of water in these bays is an important component of this natural system and plays a vital role in the productivity of the area.

In addition to fishing, this area of Texas has many additional uses including boating, birding and swimming. Other uses in the watershed include production of oil and gas, cultivation of rice, sorghum, and cotton, livestock grazing of pastureland, and commercial and residential developments.

Project Development

This project was initiated by the TCEQ in May 2004 through a contract with the University of Texas Marine Science Institute (UTMSI) in Port Aransas. Tasks included the review of existing data, development of a detailed water quality monitoring plan and quality assurance project plan, and the implementation of those plans. The monitoring was completed in October of 2006. The results of the detailed monitoring showed that dissolved oxygen and pH levels in the bays and harbor were at or above the range necessary to support a healthy aquatic ecosystem. As a result of this new data, Bay/Powderhorn Lake (Segment 2451), Tres Palacios/Turtle Bay (Segment 2452), Carancahua Bay (Segment 2456) and Conn Brown Harbor

(Segment 2483A) were removed from the state's list of impaired water bodies (Texas 303[d] list) because they were found to meet their respective dissolved oxygen and pH criteria. The Bacteria impairments associated with these segments will be address under a separate project. Project reports are available at the project Web page:

<www.tceq.state.tx.us/implementation/water/tmdl/62-matagorda.html#documents>.

Public Participation Process

TCEQ, UTMSI, and TAMCC Project Representatives sought to include input from all interested parties in this project. Stakeholders were identified and included in the planning, implementation and deliberations throughout the duration of the project.

For More Information

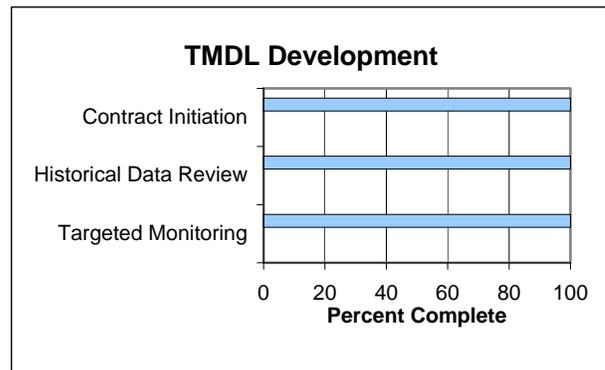
TCEQ Contact:

Earlene Lambeth, Outreach Coordinator
(512) 239-3129, elambeth@tceq.state.tx.us

TMDL Development Status

Start Date: May 2004

Projected End Date: February 2006



TMDL Project Highlights

- Monitoring for 24-hour dissolved oxygen, pH and other routine field parameters began at seven stations in June 2004. The monitoring was conducted monthly throughout the index period (Apr-Oct) and continued through October 2006.
- Five public participation meetings were held between October 2005 and February 2007 four in Palacios and one in Corpus Christi. TCEQ, UTMSI, and TAMUCC project representatives informed stakeholders of the results of the monitoring and discussed the next steps in the project.
- Monitoring results through October 2006 indicate that water quality standards are being met at all stations in the bays and harbor. Concerns remain for stations located in Palacios Harbor (13382 and 18867).
- Based on the monitoring results the following segments were removed from the 2006 Texas 303d List: Tres Palacios/Turtle Bay (2452), Matagorda Bay (2451), and Conn Brown Harbor (2483A) for dissolved oxygen, and Carancahua Bay (2456) for pH. All segments remain of the state's 303(d) list for bacteria in oyster waters.
- All segments included in this project will continue to be monitored for compliance with Texas Water Quality Standards on a quarterly basis; any standards violations observed will be addressed through TMDL development.