

**Total Maximum Daily Loads for Indicator Bacteria  
in the Houston Metropolitan Area**

**Contract No. 582-6-70860  
Work Order 582-6-70860-23**

**1<sup>st</sup> Quarterly Report**

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## INTRODUCTION

Twenty-seven segments in the general Houston Metropolitan Area (see Table 1) are considered impaired water bodies for contact recreation because they do not meet indicator bacteria (*Escherichia coli* (*E. coli*)) water quality standards. These segments are in a number of watersheds in the San Jacinto River basin including, Greens Bayou Watershed, Halls Bayou Watershed, Hunting Bayou Watershed, Brays Bayou Watershed, Sims Bayou Watershed, and the general Houston Ship Channel Watershed.

For the purpose of TMDL development, the project has been subdivided into five sub-projects; Greens Bayou Watershed – Bacteria, Halls Bayou Watershed – Bacteria, Brays Bayou Watershed – Bacteria, Sims Bayou Watershed, and Eastern Houston – Bacteria. The Eastern Houston watershed contains all of the bacteria impaired segments in the Houston Ship Channel and Houston Ship Channel/Buffalo Bayou watersheds. All of these segments are fresh water bodies with contact recreation use and they drain into the tidally influenced Houston Ship Channel and Houston Ship Channel/Buffalo Bayou segments with non-contact recreation use.

Greens Bayou (segment 1016) was placed on the Texas Clean Water Act 303(d) List in 1996 and the remaining 26 segments were listed in 2002. All of these segments were placed on the 303(d) list for not meeting contact recreation water quality standards. The purpose of this study is to provide the Texas Commission on Environmental Quality (TCEQ) with the information and assistance necessary for the preparation of a Total Maximum Daily Load (TMDL) for the indicator bacteria (*E. coli*) impairments.

The information gathered under this project will be used to develop the TMDL allocations. First, the TMDL allocations identify how much indicator bacteria (*E. coli*) the water bodies can assimilate and maintain the contact recreation standard (load capacity). Second, the TMDL allocations identify how much reduction is needed to the sources of indicator bacteria (*E. coli*) to reach the contact recreation standard. Reductions are identified for two broad categories of indicator bacteria sources, those sources that are covered by permits referred to as the waste load allocation (WLA) and those sources that are not covered by a permit referred to as the load allocation (LA). This relationship is referred to as the TMDL equation and it is expressed as:  $LC = LA + WLA$ .

In 2000, the State of Texas adopted new bacteria standards for contact recreation. The *E. coli* indicator bacteria standard was adopted for contact recreation in place of the existing fecal coliform indicator bacteria. For fecal coliform, no sample should exceed 400 colony-forming units (cfu) per 100 mL for contact recreation. In addition, the geometric mean should be less than 200 cfu/100 mL. For *E. coli*, no sample should exceed 394 cfu/100 mL and the geometric mean should be less than 126 cfu/100 mL (30 Texas Administrative Code 307.7(b)(A)).

The overall objective of this project is to establish the TMDL allocation equation for the segments listed above.

There are five tasks for WO 582-6-70860-23:

1. Administer Project;
2. Participate in Public/Advisory Group Process;
3. Development of TMDLs for Contact Recreation Segments;
4. Complete analyses for 5c Segments; and
5. Preparation of Technical Guidance Documents

This report describes the progress for the period from September 2008 through November 2008 for the metro project.

## **TASK PROGRESS**

### **TASK 1 Administer Project**

UH administered all aspects of the project during the quarter.

### **TASK 2 Participate in Public/Advisory Group Process**

Numerous public participation meetings were set-up by TCEQ and HGAC for the metro project in November 2008. Slides were prepared for all the watersheds and transmitted to TCEQ, and Geographic Information Systems (GIS) data layers were prepared and transmitted to HGAC for development of maps and graphic illustrations to support the meetings. The project team attended all meetings and participated in technical support activities.

Additionally, a number of Bacteria Implementation Group (BIG) meetings and activities occurred during the past quarter. The projected team attended and supported all meetings held during the quarter.

### **TASK 3 Development of TMDLs for Contact Recreation Segments**

Draft Technical Guidance Documents for all metro watersheds submitted in FY08 were revised based on comments received from TCEQ. Additional comments forwarded by TCEQ during this quarter included development of graphic tools for calculating waste load allocations and load allocations for various water quality standards for all metro watersheds. These comments are currently being addressed.

### **TASK 4 Complete Analyses for 5c Segments**

The data gathered in FY08 for 5c segments have been analyzed, tabulated and graphed. The results will be presented in detail in a subsequent report.

**TASK 5      Preparation of Technical Guidance Documents**

As mentioned in Task 2 above, additional comments were received from TCEQ during the quarter that necessitate revising the guidance documents. This is currently underway.

Table 1. Metro Segments

<b>TMDL Project Name</b>	<b>Segment Number</b>	<b>Segment Name</b>
<b>Eastern Houston - Bacteria</b>	1006F	Big Gulch Above Tidal
	1006H	Spring Gully Above Tidal
	1007F	Berry Bayou Above Tidal
	1007G	Kuhlman Gully Above Tidal
	1007H	Pine Gully Above Tidal
	1007I	Plum Creek Above Tidal
	1007K	Country Club Bayou
	1007M	Unnamed Non-Tidal Tributary of Hunting Bayou
	1007O	Unnamed Non-Tidal Tributary of Buffalo Bayou
	1007R	Hunting Bayou Above Tidal
<b>Greens Bayou Watershed – Bacteria</b>	1016	Greens Bayou Above Tidal
	1016A	Garners Bayou
	1016B	Unnamed Tributary of Greens Bayou
	1016C	Unnamed Tributary of Greens Bayou
	1016D	Unnamed Tributary of Greens Bayou
<b>Halls Bayou Watershed – Bacteria</b>	1006D	Halls Bayou below US 59
	1006E	Halls Bayou above US 59
	1006I	Unnamed Tributary of Halls Bayou
	1006J	Unnamed Tributary of Halls Bayou
<b>Brays Bayou Watershed – Bacteria</b>	1007B	Brays Bayou Above Tidal
	1007C	Keegans Bayou above tidal
	1007E	Willow Waterhole Bayou Above Tidal
	1007L	Unnamed Non-Tidal Tributary of Brays Bayou
	1007P	Brays Bayou Above Tidal
<b>Sims Bayou Watershed – Bacteria</b>	1007D	Sims Bayou Above Tidal
	1007N	Unnamed Non-Tidal Tributary of Sims Bayou
	1007Q	Sims Bayou Above Tidal