

# **Total Maximum Daily Load Organic Enrichment / Low DO For Mulatto Bayou Industrial Canal**



## **Pearl River Basin Pearl River County, Mississippi**

Prepared By

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Office of Pollution Control  
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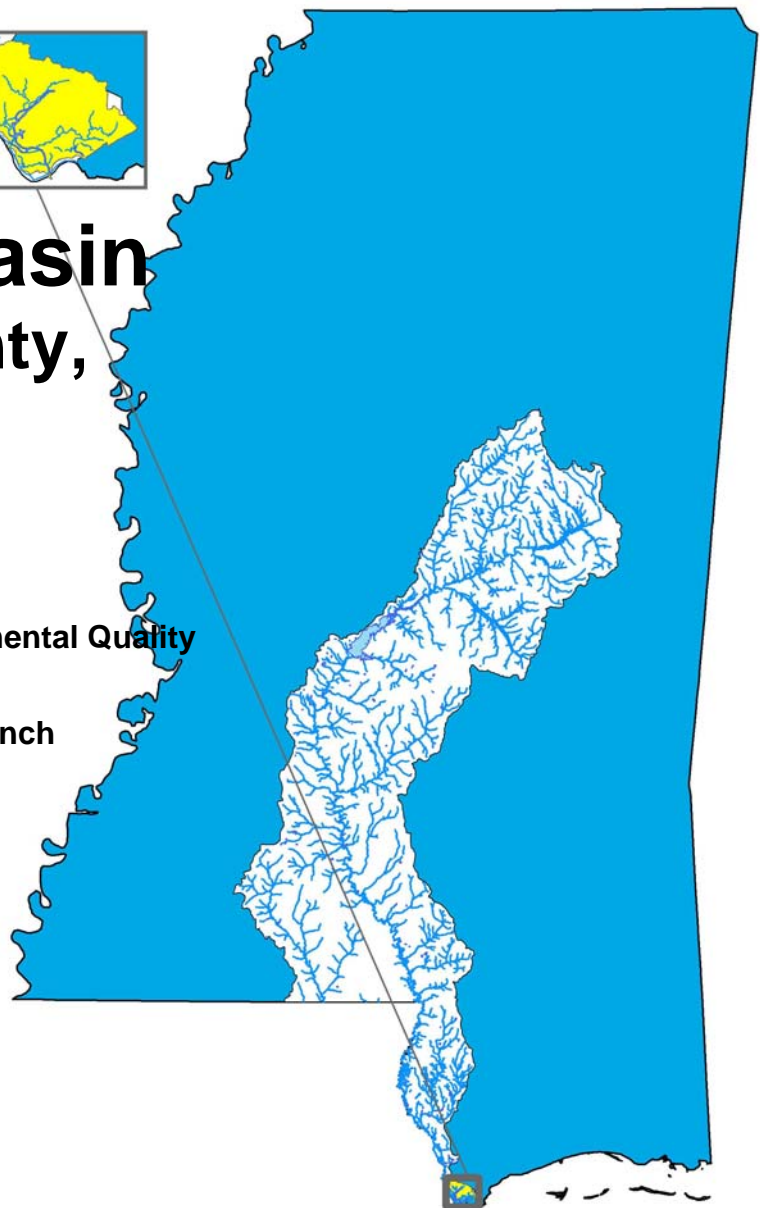
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## FOREWORD

This report has been prepared in accordance with the schedule contained within the federal consent decree dated December 22, 1998. The report contains one or more Total Maximum Daily Loads (TMDLs) for water body segments found on Mississippi's 1996 Section 303(d) List of Impaired Water bodies. Because of the accelerated schedule required by the consent decree, many of these TMDLs have been prepared out of sequence with the State's rotating basin approach. The implementation of the TMDLs contained herein will be prioritized within Mississippi's rotating basin approach.

The amount and quality of the data on which this report is based are limited. As additional information becomes available, the TMDLs may be updated. Such additional information may include water quality and quantity data, changes in pollutant loadings, or changes in landuse within the watershed. In some cases, additional water quality data may indicate that no impairment exists.

### Conversion Factors

To convert from	To	Multiply by	To convert from	To	Multiply by
mile <sup>2</sup>	acre	640	acre	ft <sup>2</sup>	43560
km <sup>2</sup>	acre	247.1	days	seconds	86400
m <sup>3</sup>	ft <sup>3</sup>	35.3	meters	feet	3.28
ft <sup>3</sup>	gallons	7.48	ft <sup>3</sup>	gallons	7.48
ft <sup>3</sup>	liters	28.3	hectares	acres	2.47
cfs	gal/min	448.8	miles	meters	1609.3
cfs	MGD	0.646	tonnes	tons	1.1
m <sup>3</sup>	gallons	264.2	µg/l * cfs	gm/day	2.45
m <sup>3</sup>	liters	1000	µg/l * MGD	gm/day	3.79

Fraction	Prefix	Symbol	Multiple	Prefix	Symbol
10 <sup>-1</sup>	deci	d	10	deka	da
10 <sup>-2</sup>	centi	c	10 <sup>2</sup>	hecto	h
10 <sup>-3</sup>	milli	m	10 <sup>3</sup>	kilo	k
10 <sup>-6</sup>	micro	µ	10 <sup>6</sup>	mega	M
10 <sup>-9</sup>	nano	n	10 <sup>9</sup>	giga	G
10 <sup>-12</sup>	pico	p	10 <sup>12</sup>	tera	T
10 <sup>-15</sup>	femto	f	10 <sup>15</sup>	peta	P
10 <sup>-18</sup>	atto	a	10 <sup>18</sup>	exa	E

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## TMDL INFORMATION PAGE

**Table 1. Listing Information**

Name	ID	County	HUC	Evaluated Cause
<b>Mulatto Bayou Industrial Canal</b>	MS186E1	Pearl River	03180004	Organic Enrichment / Low DO
At Port Bienville Industrial Park from headwaters to mouth at Pearl River				

**Table 2. Water Quality Standards**

Parameter	Beneficial use	Water Quality Criteria
		<p>DO concentrations shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l. Natural conditions are defined as background water quality conditions due only to non-anthropogenic sources. The criteria herein apply specifically with regard to substances attributed to sources (discharges, nonpoint sources, or instream activities) as opposed to natural phenomena. Waters may naturally have characteristics outside the limits established by these criteria. Therefore, naturally occurring conditions that fail to meet criteria should not be interpreted as violations of these criteria.</p>

**Table 3. Total Maximum Daily Load for Mulatto Bayou Industrial Canal**

	WLA lbs/day	LA lbs/day	MOS	TMDL lbs/day
TBODu	0	16534	Implicit	16534*

\*Based on a background concentration of 2 mg/l at the estimated volume of the canal

## **EXECUTIVE SUMMARY**

This TMDL has been developed for Mulatto Bayou Industrial Canal which was originally placed on the Mississippi 1996 Section 303(d) List of Impaired Water Bodies based on an evaluated cause. Mulatto Bayou Industrial Canal was listed due to the discharge from the NPDES permitted Port Bienville Industrial Park. Since that time, however, the NPDES discharge point has been moved to the Pearl River and no longer discharges into the industrial canal. This TMDL will provide an estimate of the total biochemical oxygen demand (TBODu) allowable in the canal.

The Mulatto Bayou Industrial Canal is located in HUC 03180004. The listed portion of Mulatto Bayou Industrial Canal is in Port Bienville Industrial Park and connects to the Pearl River. The canal was dug from the Pearl River to access several industrial complexes within the Industrial Park. It is located adjacent to Mulatto Bayou.

The TMDL will be based on the volume of the canal and anticipates that no future NPDES permit will be issued for discharge directly into the canal.

## INTRODUCTION

### 1.1 Background

The identification of water bodies not meeting their designated use and the development of total maximum daily loads (TMDLs) for those water bodies are required by Section 303(d) of the Clean Water Act and the Environmental Protection Agency's (EPA) Water Quality Planning and Management Regulations (40 CFR part 130). The TMDL process is designed to restore and maintain the quality of those impaired water bodies through the establishment of pollutant specific allowable loads. This TMDL has been developed for the 2008 §303(d) listed segment shown in Figure 1.

### 1.2 Listing History

The segment was originally listed for the evaluated causes of organic enrichment / low dissolved oxygen, pH, and toxicity. The original listing was due to information gathered about the discharge into the canal and the suspected inability of the canal to flush the discharge out into the Pearl River. The canal is tidally influenced. Mulatto Bayou Industrial Canal was not monitored, only suspected to be impaired. This TMDL addresses the evaluated organic enrichment / low DO listing from 1996.

### 1.3 Applicable Water Body Segment Use

The water use classifications are established by the State of Mississippi in the document *State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters* (MDEQ, 2007). The designated beneficial use for the listed segments is Fish and Wildlife.

### 1.4 Applicable Water Body Segment Standards

The water quality standard applicable to the use of the water body and the pollutant of concern is defined in the *State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters* (MDEQ, 2007). The standard for dissolved oxygen states, "DO concentrations shall be maintained at a daily average of not less than 5.0 mg/l with an instantaneous minimum of not less than 4.0 mg/l." In addition, the State water quality standard regulations include a natural condition clause which will be used to determine the appropriate DO for Mulatto Bayou Industrial Canal under critical conditions. Natural conditions are defined as background water quality conditions due only to non-anthropogenic sources. The criteria herein apply specifically with regard to substances attributed to sources (discharges, nonpoint sources, or instream activities) as opposed to natural phenomena. Waters may naturally have characteristics outside the limits established by these criteria. Therefore, naturally occurring conditions that fail to meet criteria should not be interpreted as violations of these criteria.



**Figure 1. Satellite Image of Mulatto Bayou Industrial Canal (MS186E1)**

## **WATER BODY ASSESSMENT**

### **2.1 Water Quality Data**

No historical data are available (MDEQ, 2008).

### **2.2 Assessment of Point Sources**

The original point source located within the canal has been moved and there are no discharges going into the canal. The stormwater runoff has also been diverted to the Pearl River discharge point.

### **2.3 Assessment of Non-Point Sources**

Non-point loading of organic material in a water body results from the transport of the pollutants



into receiving waters by overland surface runoff, groundwater infiltration, and atmospheric deposition. The Industrial Park stormwater is controlled and discharged into the Pearl River. The only nonpoint source known is atmospheric deposition directly into the canal or immediately adjacent to the canal that is not captured by the stormwater control system.

## ALLOCATION

### 3.1 Wasteload Allocation

The WLA will be set to zero. The original listing was based on an evaluated listing in relation to the NPDES discharge point that was previously located in the canal. The Industrial Park has since moved the discharge point into the Pearl River. There is no longer a direct point source discharge in the industrial canal.

### 3.2 Load Allocation

Best management practices (BMPs) should be encouraged in the watersheds to reduce potential TBODu loads from non-point sources. The LA for TBODu was calculated by multiplying the volume of the canal by 2.0 mg/L as an estimate for typical background condition.

For land disturbing activities related to silviculture, construction, and agriculture, it is recommended that practices, as outlined in “Mississippi’s BMPs: Best Management Practices for Forestry in Mississippi” (MFC, 2000), “Planning and Design Manual for the Control of Erosion, Sediment, and Stormwater” (MDEQ, et. al, 1994), and “Field Office Technical Guide” (NRCS, 2000), be followed, respectively.

### 3.3 Incorporation of a Margin of Safety

The margin of safety is a required component of a TMDL and accounts for the uncertainty about the relationship between pollutant loads and the quality of the receiving water body. The two types of MOS development are to implicitly incorporate the MOS using conservative model assumptions or to explicitly specify a portion of the total TMDL as the MOS. The MOS selected for this model is implicit.

### 3.4 Calculation of the TMDL

The TBODu portion of the TMDL was calculated by setting the background TBODu concentration to 2.0 mg/l and multiplying the concentration by an estimated volume of the canal. The canal was measured off of the satellite image with an assumed depth of 5m to provide an estimated volume of  $3.75 \times 10^6 \text{ m}^3$ . The equation to determine the TBODu in pounds per day is:

$$2.0 \frac{\text{mg}}{\text{L}} * 3.75 \times 10^6 \text{ m}^3 * 1000 \frac{\text{L}}{\text{m}^3} * 2.2046 \times 10^{-6} \frac{\text{lbs}}{\text{mg}} = 16534 \text{ lbs}$$

**Table 4. TMDL Loads**

	<b>WLA lbs/day</b>	<b>LA lbs/day</b>	<b>MOS</b>	<b>TMDL lbs/day</b>
TBODu	<b>0</b>	<b>16534</b>	<b>Implicit</b>	<b>16534</b>

### 3.5 Seasonality and Critical Condition

This TMDL accounts for seasonal variability by requiring allocations that ensure year-round protection of water quality standards, including during critical conditions.

## CONCLUSION

The original listing of this canal was based on an evaluated listing in relation to the NPDES discharge point that used to be in the canal. The industrial park has since moved the discharge point into the Pearl River. There is no longer a direct point source discharge in the industrial canal. This will provide improved water quality for organic enrichment and the support of aquatic life in the water bodies, and will result in the attainment of the applicable water quality standards.

### 4.1 Next Steps

MDEQ's Basin Management Approach and Nonpoint Source Program emphasize restoration of impaired waters with developed TMDLs. During the watershed prioritization process to be conducted by the Pearl River Basin Team, this TMDL will be considered as a basis for implementing possible restoration projects. The basin team is made up of state and federal resource agencies and stakeholder organizations and provides the opportunity for these entities to work with local stakeholders to achieve quantifiable improvements in water quality. Together, basin team members work to understand water quality conditions, determine causes and sources of problems, prioritize watersheds for potential water quality restoration and protection activities, and identify collaboration and leveraging opportunities. The Basin Management Approach and the Nonpoint Source Program work together to facilitate and support these activities.

The Nonpoint Source Program provides financial incentives to eligible parties to implement appropriate restoration and protection projects through the Clean Water Act's Section 319 Nonpoint Source (NPS) Grant Program. This program makes available around \$1.6M each grant year for restoration and protections efforts by providing a 60% cost share for eligible projects.

Mississippi Soil and Water Conservation Commission (MSWCC) is the lead agency responsible for abatement of agricultural NPS pollution through training, promotion, and installation of BMPs on agricultural lands. USDA Natural Resource Conservation Service (NRCS) provides technical assistance to MSWCC through its conservation districts located in each county. NRCS assists animal producers in developing nutrient management plans and grazing management plans. MDEQ, MSWCC, NRCS, and other governmental and nongovernmental organizations work closely together to reduce agricultural runoff through the Section 319 NPS Program.

Mississippi Forestry Commission (MFC), in cooperation with the Mississippi Forestry Association (MFA) and Mississippi State University (MSU), have taken a leadership role in the development and promotion of the forestry industry Best Management Practices (BMPs) in Mississippi. MDEQ is designated as the lead agency for implementing an urban polluted runoff control program through its Stormwater Program. Through this program, MDEQ regulates most construction activities. Mississippi Department of Transportation (MDOT) is responsible for implementation of erosion and sediment control practices on highway construction.

Due to this TMDL, projects within this watershed will receive a higher score and ranking for funding through the basin team process and Nonpoint Source Program described above.

## **4.2 Public Participation**

This TMDL will be published for a 30-day public notice. During this time, the public will be notified by publication in the statewide newspaper. The public will be given an opportunity to review the TMDLs and submit comments. MDEQ also distributes all TMDLs at the beginning of the public notice to those members of the public who have requested to be included on a TMDL mailing list. Anyone wishing to become a member of the TMDL mailing list should contact Kay Whittington at [Kay\\_Whittington@deq.state.ms.us](mailto:Kay_Whittington@deq.state.ms.us).

All comments should be directed to [Kay\\_Whittington@deq.state.ms.us](mailto:Kay_Whittington@deq.state.ms.us) or Kay Whittington, MDEQ, PO Box 2261, Jackson, MS 39225. All comments received during the public notice period and at any public hearings become a part of the record of this TMDL and will be considered in the submission of this TMDL to EPA Region 4 for final approval.

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