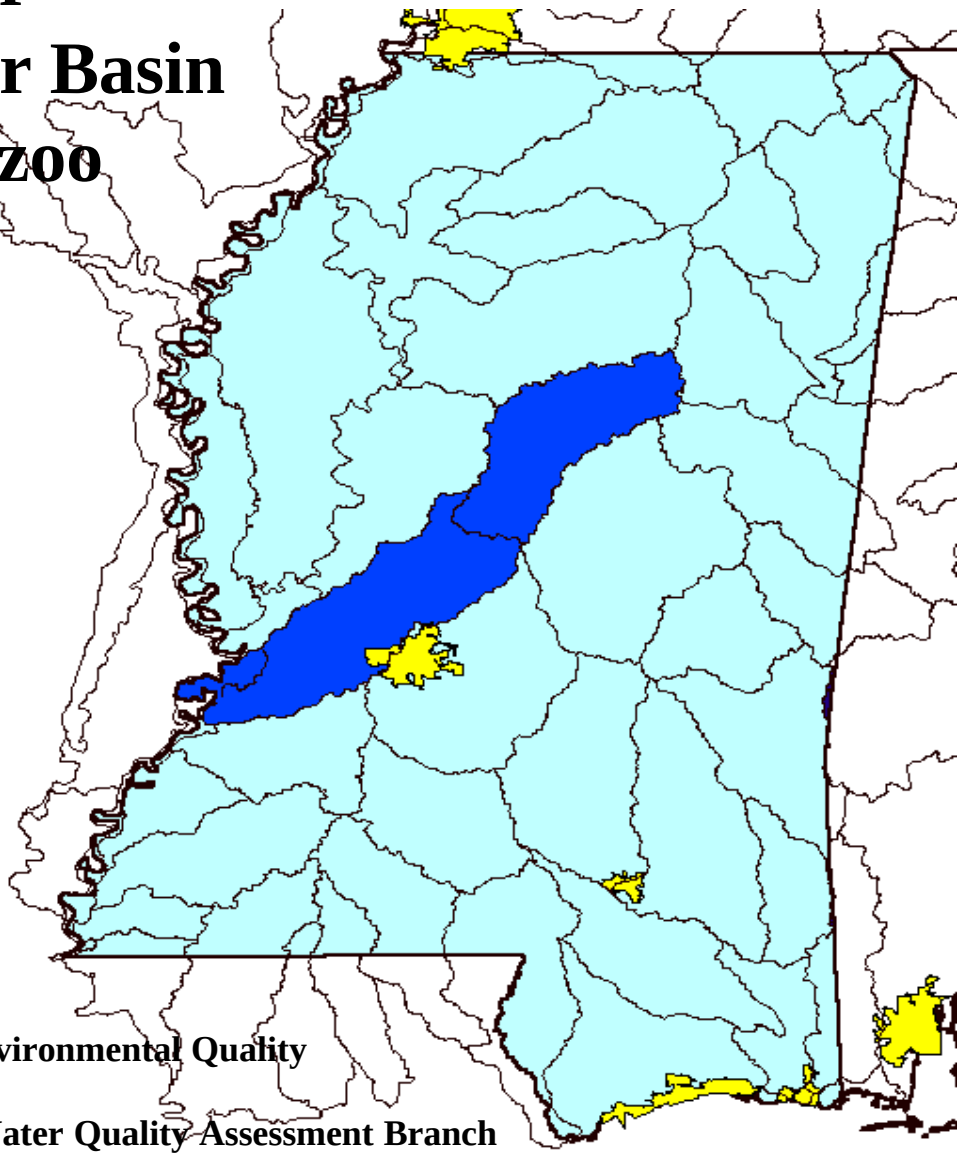
Proposed TMDL
February 27, 2001

TMDL For Low pH in the Big Black River Big Black River Basin Madison & Yazoo Counties, Mississippi



Prepared by
Mississippi Department of Environmental Quality
Office of Pollution Control
TMDL/WLA Section of the Water Quality Assessment Branch

MDEQ
P.O. Box 10385
Jackson, MS 39289-0385
(601) 961-5171

FOREWORD

This report has been prepared in accordance with the schedule contained within the federal consent decree dated December 22, 1998. *(Sierra Club v. Hankinson, No. 97-CV-3683 (N.D> Ga.)*) The report contains one or more Total Maximum Daily Loads (TMDLs) for waterbody segments found on Mississippi's 1996 Section 303(d) List of Impaired Waterbodies. 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 segments addressed are comprised of monitored segments that have data indicating impairment. 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.

Prefixes for fractions and multiples of SI units

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

Conversion Factors

To convert from	To	Multiply by	To Convert from	To	Multiply by
Acres	Sq. miles	0.0015625	Days	Seconds	86400
Cubic feet	Cu. Meter	0.028316847	Feet	Meters	0.3048
Cubic feet	Gallons	7.4805195	Gallons	Cu feet	0.133680555
Cubic feet	Liters	28.316847	Hectares	Acres	2.4710538
cfs	Gal/min	448.83117	Miles	Meters	1609.344
cfs	MGD	.6463168	Mg/l	ppm	1
Cubic meters	Gallons	264.17205	µg/l * cfs	Gm/day	2.45

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MONITORED SEGMENT IDENTIFICATION

Name:	Big Black River Segment 1
Waterbody ID:	MSLBGBKRM1
Location:	Near Canton: from highway 51/17 south of Pickens to confluence with Bear Creek
County:	Madison and Yazoo
USGS HUC Code:	08060202
Length:	9 miles
Use Impairment:	Aquatic Life Support
Cause Noted:	Low pH
Priority Rank:	69
Standards Variance:	None
Pollutant Standard:	The normal pH of the waters shall be 6.5 to 9.0 and shall not be caused to vary more than 1.0 unit; however, should the natural background pH be outside the 6.5 to 9.0 limits, it shall not be changed more than 1.0 unit unless after the change the pH will fall within the 6.5 to 9.0 limits, and the Commission on Environmental Quality determines that there will be no detrimental effect on stream usage as a result of the greater pH change.
TMDL Report:	This segment has data that indicate an apparent natural cyclic occurrence of low pH each spring.

EXECUTIVE SUMMARY

One segment of the Big Black River has been placed on the Mississippi 1998 Section 303(d) List of Waterbodies as an impaired waterbody segment due to low pH. pH is defined as a measure of acidity and alkalinity of a solution that is a number on a scale on which a value of 7 represents neutrality and lower numbers indicate increasing acidity and higher number increasing alkalinity and on which each unit of change represents a tenfold change in acidity or alkalinity and that is the negative logarithm of the effective hydrogen-ion concentration or hydrogen-ion activity in gram equivalents per liter of the solution. The applicable state standard specifies the normal pH of the waters shall be 6.5 to 9.0 and shall not be caused to vary more than 1.0 unit. However, should the natural background pH be outside the 6.5 to 9.0 limits, it shall not be changed more than 1.0 unit unless after the change the pH will fall within the 6.5 to 9.0 limits. And, the Commission determines that there will be no detrimental effect on stream usage as a result of the greater pH change. A review of the available monitoring data for the watershed indicates that the levels of pH are sometimes below the normal limits. However, these data indicate that the level of impairment is almost always within 1 pH unit of the standard and is apparently caused by natural conditions.

The Big Black River flows approximately 300 miles in a southwestern direction from its headwaters until it reaches the Mississippi River south of Vicksburg. The watershed lies completely within Mississippi. This TMDL Report has been developed for the section of the Big Black River found on the monitored portion of the Mississippi 1998 Section 303(d) List.

The pH loading estimates from nonpoint sources in the watershed were from the watershed runoff, the soil acidity, and the acidic contribution from pine needles. There are several active NPDES Permitted discharge located in the watershed and included in the study. Each of these permitted facilities has a pH limit requirement in their NPDES Permit. These are listed in appendix A.

The purpose of this TMDL is to report on the study to determine if the pH levels found in the stream are indeed caused by a controllable source or by natural background. The study of low pH in these watersheds indicates that the variance to the standard is due to natural, uncontrollable sources.

INTRODUCTION

1.1 Background

The identification of waterbodies not meeting their designated use and the development of total maximum daily loads (TMDLs) for those waterbodies 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 waterbodies through the establishment of pollutant specific allowable loads. The pollutant of concern for this TMDL is slightly acidic water as indicated by measurements of low pH.

The Mississippi Department of Environmental Quality (MDEQ) has a segment of the Big Black River as being impaired due to low pH as reported in the Mississippi 1998 Section 303(d) List of Waterbodies. The segment was originally listed because monitoring data showed that the pH level was not within the water quality standards' approved range. However, for this indicator, natural background contributions do not necessarily indicate impairment.

The purpose of this TMDL is to report on the study to determine if the pH levels found in the stream segments are indeed caused by a controllable source or by natural background. The section of the Big Black River in Madison County and Yazoo County is shown in Figure 1.

The Big Black River Basin lies totally within the state and is composed of 3,400 square miles. The basin is 155 miles long, averages 22 miles in width and has approximately 6,360 linear miles of river and streams. This basin originates in north central Mississippi and flows southwesterly to the Mississippi River. The Big Black River itself enters the Mississippi River just south of Vicksburg after flowing approximately 300 miles. Major tributaries to the Big Black River include Big Bywy Ditch, Zilpha Creek, Apookta Creek, Doaks Creek, Bear Creek, Bogue Chitto Creek and Fourteen Mile/Bakers Creek. The basin is sparsely populated and is hilly to gently rolling and largely forested. However, significant amounts of cattle ranching and farming are present. Oil and gas production is a major industry in the area. The Big Black River Basin does not have large-scale development and most of its tributaries are wild and undeveloped, and thus are in a relatively natural condition.[1]

Generally, the Big Black River and most of its tributaries, especially in the northern part of the basin, carry large amounts of suspended sediment and are very turbid most of the time. Some of the streams in the basin are muddy and slow flowing, while others have relatively clear water and are swift with sandy bottoms. Overall, the water quality in the basin is rated as fair.[2]

1 Mississippi 1998 Water Quality Assessment, Federal Clean Water Act Section 305(b) Report, p. 169.
2 Ibid.

1.2 Applicable Waterbody Segment Use

Designated beneficial uses and water quality standards are established by the *State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters* regulations. The designated use for Big Black River as defined by the regulations is Fish and Wildlife.

1.3 Applicable Waterbody Segment Standard

The water quality standard applicable to the use of the waterbody and the pollutant of concern is defined in the *State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters*. The standard states that the normal pH of the waters shall be 6.5 to 9.0 and shall not be caused to vary more than 1.0 unit. However, should the natural background pH be outside the 6.5 to 9.0 limits, it shall not be changed more than 1.0 unit unless after the change the pH will fall within the 6.5 to 9.0 limits. And the Commission determines that there will be no detrimental effect on stream usage as a result of the greater pH change. It is our opinion that the Big Black River should be covered by the 1.0 unit allowable for the natural background exclusion.

TMDL ENDPOINT AND WATER QUALITY ASSESSMENT

2.1 Selection of a TMDL Endpoint and Critical Condition

One of the major components of a TMDL is the establishment of instream numeric endpoints, which are used to evaluate the attainment of acceptable water quality. Instream numeric endpoints, therefore, represent the water quality goals that are to be achieved by implementing the load and wasteload reductions specified in the TMDL. The endpoints allow for a comparison between observed instream conditions and conditions that are expected to restore designated uses. The instream target for low pH is that the normal pH of the waters shall be 6.5 to 9.0 and shall not be caused to vary more than 1.0 unit. However, should the natural background pH be outside the 6.5 to 9.0 limits, it shall not be changed more than 1.0 unit unless after the change the pH will fall within the 6.5 to 9.0 limits. The language in our standard is difficult to interpret, however, the 1.0 unit allowance for natural background should apply to each of these segments. If that is the case, there is no longer any impairment for low pH.

Because pH variance may be attributed to both nonpoint and point sources, the critical condition used for studying the stream response was represented by a multi-year period. Critical conditions for waters impaired by nonpoint sources generally occur during periods of wet-weather and high surface runoff. But, critical conditions for point source dominated systems generally occur during low-flow, low-dilution conditions.

2.2 Discussion of Instream Water Quality

Water quality data available for the monitored segment of the Big Black River show that low levels of pH have historically been found in the stream. There are several ambient stations operated by MDEQ that have pH monitoring data available, however, only the historical station shows an impairment for low pH. The data indicate a low pH cycle each spring. The first significant spring rains apparently cause this phenomenon.

There is not enough information available to specifically determine the cause of the low pH in the waterbody segment. It is our contention that the natural processes and soil conditions would lead to the conclusion that this low pH is caused by natural sources. This is further substantiated by the cyclic nature of the data.

2.2.1 Inventory of Available Water Quality Monitoring Data

The State's 1998 Section 305(b) Water Quality Assessment Report was reviewed to assess water quality conditions and data available for the watershed. According to the report, the Big Black River is partially supporting the use of Aquatic Life Support for low pH in one segment. By including more recent data not available when the 1998 305(b) report was completed, the Big Black River is now fully supporting. These conclusions were based on instantaneous data collected at the stations listed in Table 1. Data collected at these stations are listed below in Tables 2 - 5.

Table 2 contains the historical data that is responsible for the original listing of this segment. The data are extremely limited in quantity. There are 2 out of 9 violations (22%) which lead to the partially supporting call on the 1996 and 1998 Section 303(d) list. Table 3 lists the current data available at the ambient station near West, Mississippi. This station is located approximately 60 miles above the impaired segment. There are 9 out of 59 violations (15%) which taken alone would indicate a partially supporting segment. Table 4 lists the data from the ambient station near Bovina. This station is approximately 60 miles below the segment. There are no violations reported at this station. And finally, table 5 lists the data from MDEQ's most recent special study of the Big Black River. In 1999, a contractor was hired to study the water quality in the Big Black River on a bi-monthly basis at 5 sites along the length of the river. These data show no impairment (4.7% violation) for the entire stretch of the river. When viewed as a whole, the data indicate no significant violation (8.3%) of the pH standard.

Table 1 pH monitoring stations for the Big Black River

Segment Name	Location ID	Study Type	Location
Big Black River	Kilmichael	Special Study	Headwaters in Montgomery County near Kilmichael
Big Black River	West	Ambient Station (current)	Near West Mississippi between Holmes and Attala County
Big Black River	West	Special Study	Near West Mississippi between Holmes and Attala County
Big Black River	Goodman	Special Study	Near Pickens at Highway 51/17
Big Black River	Canton	Ambient Station (historical)	Near the confluence of Bear Creek in Madison County
Big Black River	Bovina	Ambient Station (current)	Old Highway 80 Bridge near Bovina in Warren County
Big Black River	Bovina	Special Study	Old Highway 80 Bridge near Bovina in Warren County
Big Black River	Reganton	Special Study	Near Reganton

Table 2 Canton Historical pH Data

Date	Canton pH
03/08/95	6.8
07/12/95	8.0
09/11/95	7.1
11/08/95	8.3
01/08/96	5.0
03/05/96	7.7
05/06/96	6.4
07/10/96	7.3
09/10/96	7.4

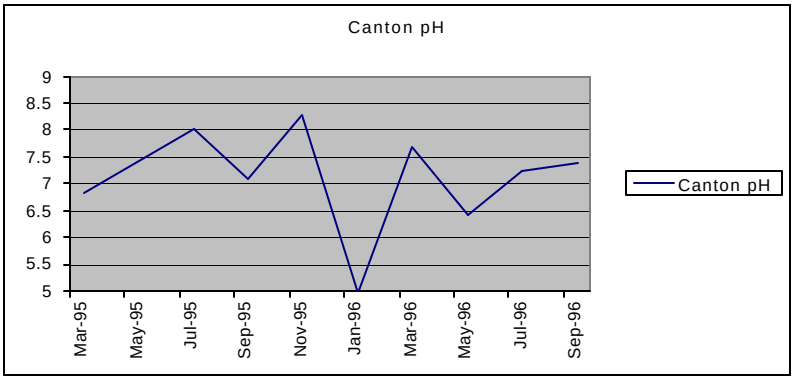


Table 3 West Ambient Station pH Data

Date	West pH
12/17/96	7.2
01/14/97	7.2
02/19/97	6.7
03/18/97	7.3
04/23/97	7.3
05/15/97	7.1
06/17/97	7.0
07/15/97	6.9
08/11/97	7.2
09/08/97	7.2
10/08/97	7.4
11/12/97	7.3
12/09/97	6.8
01/12/98	6.2
02/11/98	6.4
03/16/98	6.4
04/15/98	6.8
06/11/98	6.4
07/13/98	6.5
08/12/98	6.6
09/08/98	7.0
10/13/98	7.0
11/09/98	7.0
12/09/98	6.7
01/19/99	6.3
02/09/99	6.4
03/15/99	6.4
04/05/99	6.2
05/06/99	6.9
06/07/99	6.8
07/08/99	6.9
08/04/99	7.0
09/07/99	6.8
10/06/99	7.4
11/04/99	7.2
11/09/99	7.3
11/22/99	7.2
12/07/99	7.4
12/21/99	7.1

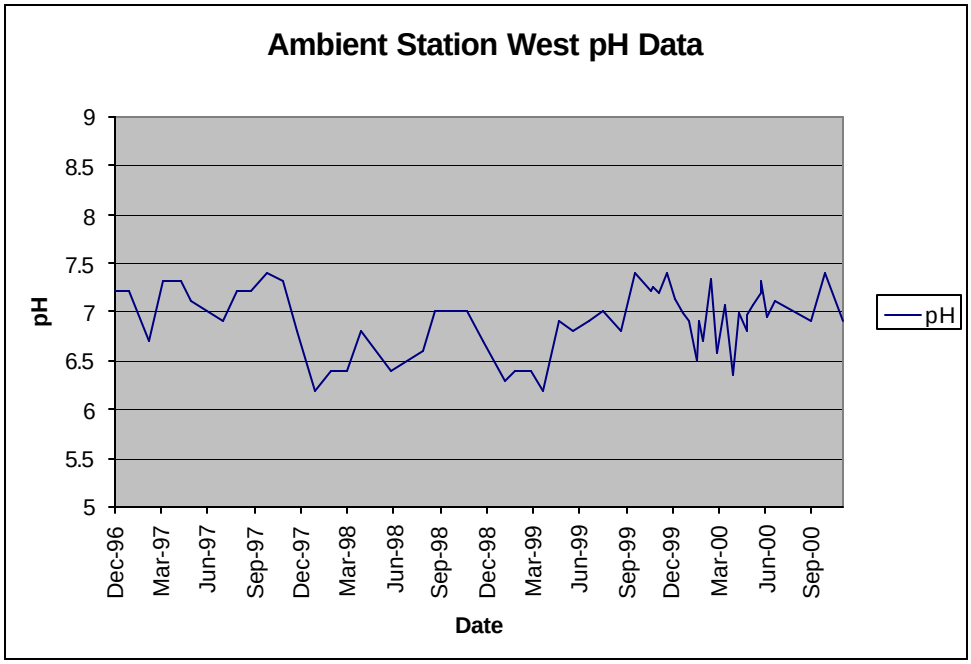


Table 3 Continued West Ambient Station Data

01/04/00	7.0
01/18/00	6.9
02/01/00	6.5
02/08/00	6.9
02/15/00	6.7
02/29/00	7.3
03/14/00	6.6
03/30/00	7.1
04/11/00	6.3
04/25/00	7.0
05/09/00	6.8
05/09/00	7.0
05/23/00	7.1
06/06/00	7.2
06/07/00	7.3
06/20/00	6.9
07/05/00	7.1
09/13/00	6.9
10/11/00	7.4
11/16/00	6.9

Table 4 Bovina Ambient Station pH Data

Date	Bovina pH
12/11/96	7.4
01/07/97	7.6
02/11/97	7.3
03/11/97	7.3
04/17/97	7.1
05/13/97	7.0
06/05/97	7.2
07/02/97	7.1
08/06/97	7.6
09/03/97	7.4
10/09/97	7.5
11/04/97	7.0
12/02/97	6.6
01/07/98	7.1
02/10/98	7.0
03/05/98	6.9
04/14/98	7.3
06/10/98	6.9
07/09/98	7.7
08/11/98	7.3
09/02/98	7.4
10/12/98	7.6
11/03/98	7.6
12/03/98	7.4
01/13/99	6.5
02/04/99	6.5
03/02/99	7.0
03/31/99	7.2
05/04/99	7.3
06/03/99	7.4
07/06/99	7.0
09/01/99	7.3
10/04/99	7.2

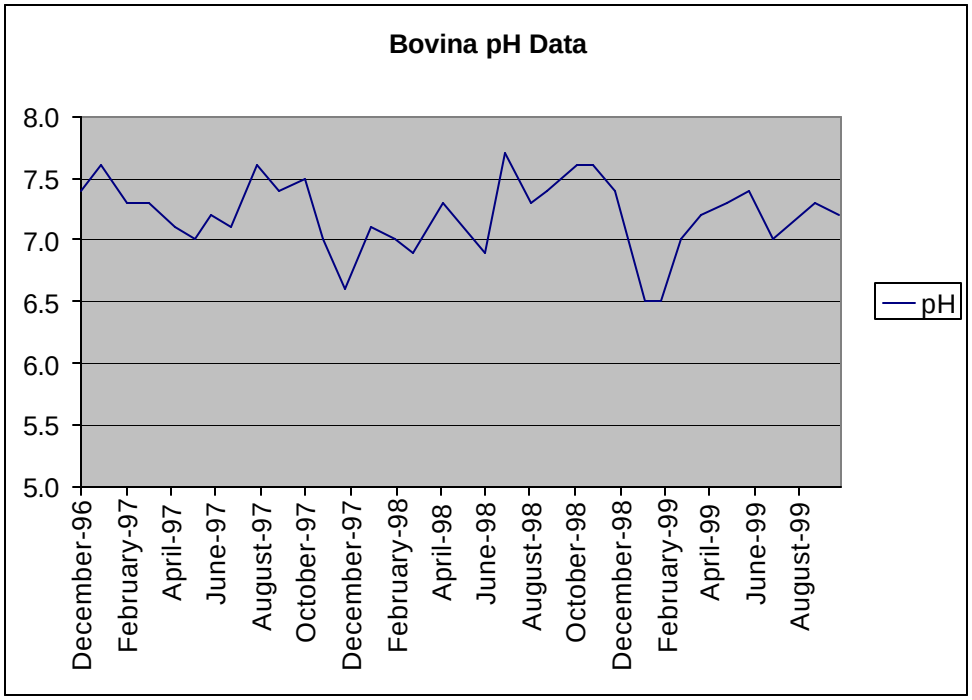
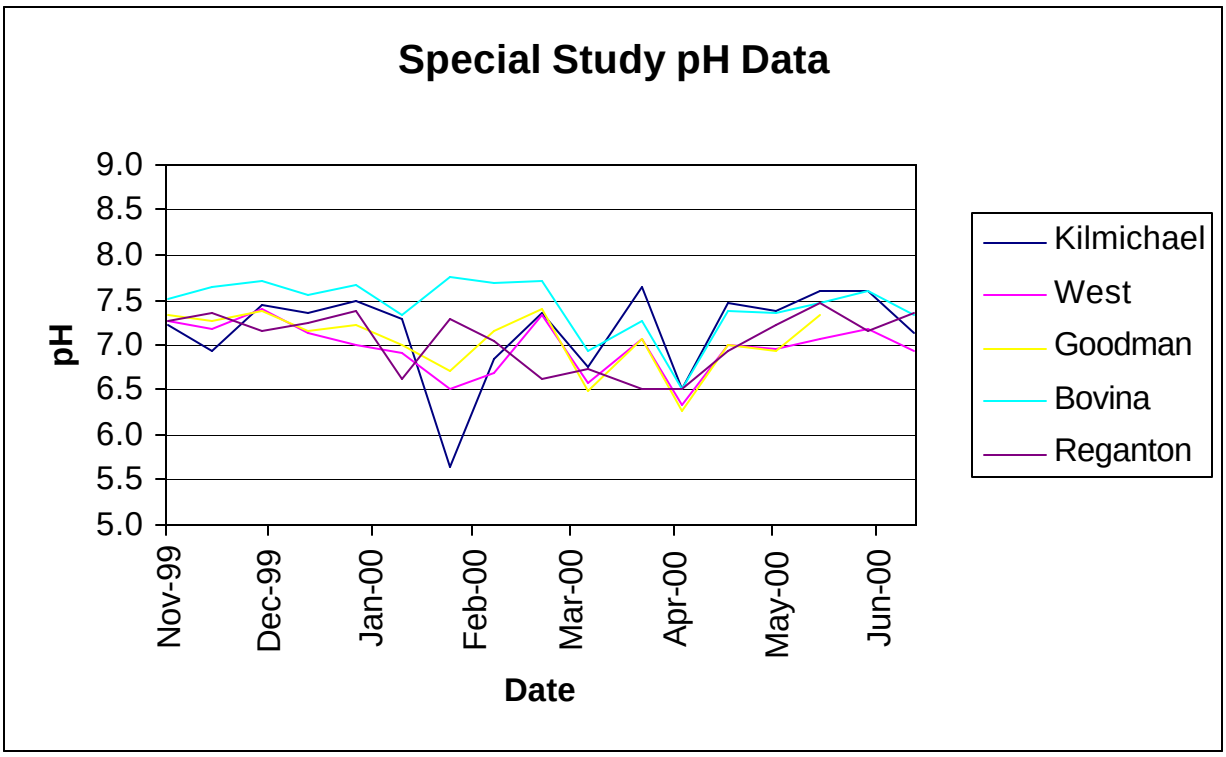


Table 5 Special Study pH Data

Date	Kilmichael	West	Goodman	Bovina	Reganton
11/09/99	7.2	7.3	7.3	7.5	7.3
11/22/99	6.9	7.2	7.3	7.6	7.4
12/07/99	7.4	7.4	7.4	7.7	7.2
12/21/99	7.3	7.1	7.2	7.6	7.3
01/04/00	7.5	7.0	7.2	7.7	7.4
01/18/00	7.3	6.9	7.0	7.3	6.6
02/01/00	5.6	6.5	6.7	7.7	7.3
02/15/00	6.8	6.7	7.2	7.7	7.1
02/29/00	7.4	7.3	7.4	7.7	6.6
03/14/00	6.8	6.6	6.5	6.9	6.7
03/30/00	7.6	7.1	7.1	7.3	6.5
04/11/00	6.5	6.3	6.3	6.5	6.5
04/25/00	7.5	7.0	7.0	7.4	6.9
05/09/00	7.4	7.0	6.9	7.4	7.2
05/23/00	7.6	7.1	7.3	7.5	7.5
06/06/00	7.6	7.2		7.6	7.2
06/20/00	7.1	6.9	7.3	7.3	7.4



2.2.2 Analysis of Instream Water Quality Monitoring Data

A statistical summary of the water quality data discussed above is presented in Table 3. The percent exceedance was calculated by dividing the number of exceedances by the total number of samples and does not represent the amount of time that the water quality was in violation. Each of the data sets for the stations is shown in the previous tables and charts. The data for Big Black River are within the 10% limit to call the water fully supporting according to the current water quality standards and this water's impairment listing in the 303(d) list should be delisted.

Table 6 pH Data Statistical Summary

Segment Name	pH Data Points	Violations	Percent Violations
Big Black River – Canton	9	2	22.2%
Big Black River – Ambient Program	92	9	9.7%
Big Black River – Special Study	84	4	4.8%

SOURCE ASSESSMENT

It is recognized that many of the sources for low pH in the stream are natural. These sources are considered uncontrollable, and this TMDL does not attempt to address any type of controlling strategy for these sources.

The TMDL evaluation summarized in this report examined all known controllable and uncontrollable pH-altering sources in the Big Black River Watershed. In evaluation of the sources, loads were characterized by the best available information, monitoring data, literature values, and local management activities. This section documents the available information and interpretation for the analysis.

3.1 Assessment of Point Sources

Point sources have their greatest potential impact on water quality during periods of low-flow. Thus, a careful evaluation of point sources was necessary in order to quantify the degree of impairment present during the low-flow, critical-condition period. Appendix A lists the all of the dischargers in the watershed, along with the NPDES Permit number.

All NPDES Permits shown in Appendix A include requirements for pH limits to meet water quality standards. Any future permits will also include this pH requirement.

3.2 Assessment of Nonpoint Sources

There are potential nonpoint sources from storm water runoff that could contribute to an alteration of pH in Big Black River, including:

- Land Application of Chicken Litter
- Acidic Soil
- Pine Needle Decay
- Urban Development

The 3,400 square mile drainage area of the Big Black River contains many different landuse types, including urban, forests, cropland, pasture, barren, and wetlands. The watershed is very rural in nature however; it contains a portion of the city of Jackson and several smaller cities. Forest is the dominant landuse within this watershed.

Septic systems have a potential to deliver pH-altering loads (either higher pH or lower pH) to surface waters due to malfunctions, failures, and direct pipe discharges. Household chemicals and waste products could be introduced into the environment by a failing septic system. Properly operating septic systems treat wastewater and dispose of the water through a series of underground field lines. The water is applied through these lines into a rock substrate, thence into underground absorption. The systems can fail when the field lines are broken, or when the underground substrate is clogged or flooded. A failing septic system's discharge can reach the surface, where it becomes available for wash-off into the stream. Another

potential problem is a direct bypass from the system to a stream. In an effort to keep the water off the land, pipes are occasionally placed from the septic tank or the field lines directly to the creek, which can be represented as a point source. The nonpoint source contribution from septic tanks is un-quantifiable for pH; however, controlling this source of pollution is a goal of this TMDL.

3.2.1 Land Application of Chicken Litter

In the Big Black River Basin processed manure from chicken houses could be a source of pH alteration in the stream. Poultry litter is a potential contributor of a pH-altering load to streams in the watershed when a rain event washes a portion of it to a receiving waterbody. It is assumed that poultry litter from chicken houses is applied to the available pastureland. While there are some alternative uses of poultry litter, such as utilization as cattle feed, almost all of the litter in the state is currently used for fertilizer.

3.2.2 Acidic Soil

Soil acidity has long been reported as a major fertility problem in the southeastern United States. To combat this problem, farmers typically apply appropriate amounts of lime to counteract the acidity, in order to increase crop production. In 1957, 216,012 tons of lime were used in Mississippi; however, by 1979 800,000 tons of lime were used on agricultural fields in Mississippi (Vanderford, 1975). Still, this was only 40% of the amount of lime necessary to adequately combat the historically acid soils for increased crop production.

A great deal of water infiltrates through the soils of humid regions such as the coastal areas of Mississippi. As water moves through the soils, hydrogen ions combine with carbon dioxide and other compounds to form weak acids, such as carbonic acid. When rainfall events occur, these weak acids will leach the lime from the soils. As this leaching from rain water occurs, calcium and other bases are gradually removed, leaving soils more acidic than before.[3]

3.2.3 Pine Needle Decay

Vast numbers of coniferous trees within the basin also contribute to the acidity of surrounding waterbodies due to the decay of the pine needles. Duffy *et al.* (1989) examined the nutrient flux in a pine forest following simulated rainfall. The pH of their simulated rainfall ranged from 3.94 – 5.18 on four different plots; however, the pH of the ensuing runoff water ranged from 4.34 – 5.0.

Assuming you have a rainfall, which itself is slightly acidic, encountering acidic pine needles, which then travels though acidic soils, one can safely deduce the surrounding receiving water will likewise be acidic in nature.[4]

3 National Sedimentation Laboratory, Water Quality and Ecological Processes Research Unit, Report on the Causes of acid pH in the Yazoo Basin, Dr. Charles Cooper, 2000.
4 Ibid.

3.2.4 Urban Development

Urban areas include land classified as urban and barren. Even though only a small percentage of the watershed is classified as urban, the contribution of the urban areas to pH alteration in Big Black River was considered. Stormwater runoff contributions from urban areas may come from construction sites, residential subdivisions, and runoff contribution from improper disposal of materials such as household toxic materials. Due to the low percentage of urban area in the watershed, this source of lower pH is considered to be very minor.

LINKING THE SOURCES TO THE ENDPOINT

Establishing the relationship between the instream water quality target and the source loading is a critical component of TMDL development. It allows for the evaluation of management options that will achieve the desired source load reductions. The link can be established though a range of techniques, from qualitative assumptions based on sound scientific principles to sophisticated modeling techniques. Ideally, the linkage will be supported by monitoring data that allow the TMDL developer to associate certain waterbody responses to flow and loading conditions.

4.1 Source Representation

Both point and nonpoint sources were represented in this study. There were several NPDES Permitted facilities in the Big Black River Watershed. These are shown in Appendix A.

4.1.1 Land Application of Chicken Litter

The contribution due to land application of poultry litter was considered in the Big Black River Watershed nonpoint source assessment. Variable monthly loading rates of litter are applied to pastureland. This litter then becomes available for surface water runoff during storm events. This could be a controllable source of pH alteration in the watershed.

4.1.2 Acidic Soil

A great deal of water infiltrates through the soils of humid regions. As water moves through the soils, hydrogen ions combine with carbon dioxide and other compounds to form weak acids, such as carbonic acid. When rainfall events occur, these weak acids will leach the lime from the soils. As this leaching from rain water occurs, calcium and other bases are gradually removed, leaving soils more acidic than before. These sources are considered uncontrollable and are not accounted for in this TMDL.

4.1.3 Pine Needle Decay

Vast numbers of coniferous trees within the basin also contribute to the acidity of surrounding waterbodies due to the decay of the pine needles. Assuming you have a rainfall, which itself is slightly acidic, encountering acidic pine needles, which then travels though acidic soils, one can safely deduce the surrounding receiving water will likewise be acidic in nature. These sources are considered uncontrollable and are not accounted for in this TMDL.

4.1.4 Urban Development

The Big Black River watershed contains many small urban areas. However, overall the area remains sparsely populated. The watershed can be considered rural and urban. The pH-altering sources are controllable; however, there is only a very limited amount of urban area in the watershed.

ALLOCATION

The allocation for this TMDL involves a wasteload permit limits for NPDES point sources necessary for attainment of water quality standards in the Big Black River. Point source contributions enter the stream directly. Nonpoint sources contributions occur as a result of rainfall events. This TMDL will only consider allocations for controllable sources of low pH.

5.1 Wasteload Allocations

The contribution of point sources was considered on a watershed basis. Effluent pH levels from each point source in the Big Black River (see Appendix A) shall be 6.5 to 9.0 standard units and shall not cause the pH in the receiving waters to vary more than 1.0 standard unit. Regarding implementation of these allocations to the NPDES permits, MDEQ will use its Reasonable Potential Procedures to determine appropriate monitoring requirements and/or limitations.

5.2 Load Allocations

For each of the 303(d)-listed segments of the Big Black River, the pH of waters originating from nonpoint sources shall be 6.5 to 9.0 standard units and shall not cause the receiving waters to vary more than 1.0 standard unit. Nonpoint loading due to acidic soil, pine needle decay, and urban development are included in the load allocation. This TMDL has been completed for the acidic property of the water. pH is an indicator of the acidic or alkalinity properties of water. It is not a classic pollutant. Control of the pH range can be achieved by dilution or by source load manipulation.

One step that should be encouraged by this TMDL is the reduction of failing septic tanks in the watershed. This reduction in septic tank failures will lead to a reduction in the overall pollution reaching the Big Black River. This might be achieved by supporting BMP projects that promote education projects that encourage homeowners to properly maintain their septic tanks by routinely pumping them out, ensuring that improper chemicals are not disposed of in the septic tank, repairing broken field lines, and properly maintaining the effluent from individual onsite wastewater treatment plants.

5.3 Incorporation of a Margin of Safety

The margin of safety shall account for the lack of knowledge concerning the relationship between pollutant loads and the quality of the receiving waterbody. The wasteload allocation and load allocation suggested in sections 5.1 and 5.2 of this report establish that effluent from all point sources and waters originating from all nonpoint sources must individually meet the water quality standards for pH. As long as pH levels from point sources and nonpoint sources are consistent with the specified wasteload allocation and load allocation, the pH in the 303(d)-listed segment of the Big Black River will be consistent with water quality standards. Therefore, a margin of safety for these pH TMDLs has been considered but was determined to be unnecessary, because there is no lack of knowledge concerning the relationship between the allocations to pollutant loads and the resulting quality of the receiving waters.

5.4 Seasonality

The charts of the data indicate a cyclic trend to pH in the stream. The theory is that the coniferous trees shed their needles, which decay and with springtime stormwater runoff alter the pH in the stream. This uncontrollable natural cyclic process will not be address by this TMDL. Seasonality is classically thought of as differing approaches to the pollutant based on variations in temperature or in rainfall. Seasonality for this within this TMDL is not based on changes between the seasons, temperature fluctuations, or rainfall events. By looking at several years worth of data, a cycle or trend is established that shows lower pH in the springtime. This corresponds to early rainfall events in the spring bringing the first acidic load from decaying coniferous trees. It is our contention that this is a natural event and is uncontrollable.

CONCLUSION

The reduction scenario used in this TMDL included requiring all NPDES Permitted dischargers to meet water quality standards for pH. Also another goal of the TMDL is reducing the pollution load from failing septic tanks in the watershed. Appendix A lists the dischargers in this watershed, along with the NPDES Permit number.

The TMDL will not impact existing or future NPDES Permits as long as the effluent meets water quality standards for pH. MDEQ will not approve any NPDES Permit application that does not plan to meet water quality standards for pH. CWA Section 319 Nonpoint Source (NPS) Grants may fund these projects. MDEQ produced guidance for future Section 319 project funding will encourage NPS restoration projects that attempt to address TMDL related issues within Section 303(d)/TMDL watersheds in Mississippi.

This TMDL is for low pH. This is an indicator of water quality and is not in and of itself a pollutant. Manipulation of the pH value in the context of a TMDL calculation is meaningless. However, the effort to reduce controllable sources of lower pH producing pollution in the stream wherever possible is meaningful. That controllable source reduction is the goal for this TMDL.

6.1 Future Monitoring

MDEQ has adopted the Basin Approach to Water Quality Management, a plan that divides Mississippi's major drainage basins into five groups. During each yearlong cycle, MDEQ resources for water quality monitoring will be focused on one of the basin groups. During the next monitoring phase in the Big Black River Basin, the Big Black River will receive additional monitoring to identify any change in water quality. These identified monitoring stations are currently included with our ambient monitoring network and monitoring will continue at these sites. Additionally, by completion of this TMDL, NPS projects proposed for this watershed that address pH will receive priority consideration for future Section 319 funding.

6.2 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 TMDL and submit comments. At the end of the 30-day period, MDEQ will determine the level of interest in the TMDL and make a decision on the necessity of holding a public hearing.

If a public hearing is deemed appropriate, the public will be given a 30-day notice of the hearing to be held at a location near the watershed. That public hearing would be an official hearing of the Mississippi Commission on Environmental Quality, and would be transcribed. All comments received during the public notice period and at any public hearings become a part of the record of this TMDL. All comments will be considered in the ultimate approval of this TMDL and for submission of this TMDL to EPA Region IV for final approval.

DEFINITIONS

Ambient stations: a network of fixed monitoring stations established for systematic water quality sampling at regular intervals, and for uniform parametric coverage over a long-term period.

Assimilative capacity: the capacity of a body of water or soil-plant system to receive wastewater effluents or sludge without violating the provisions of the State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters and Water Quality regulations.

Background: the condition of waters in the absence of man-induced alterations based on the best scientific information available to MDEQ. The establishment of natural background for an altered waterbody may be based upon a similar, unaltered or least impaired, waterbody or on historical pre-alteration data.

Calibrated model: a model in which reaction rates and inputs are significantly based on actual measurements using data from surveys on the receiving waterbody.

Coniferous: an order (Coniferales) of mostly evergreen trees and shrubs including forms (as pines) with true cones and other (as yews) with an arillate fruit.

Controllable Sources: Sources of pollutants that can be modified or controlled with regulatory requirements and/or best management practices.

Critical Condition: hydrologic and atmospheric conditions in which the pollutants causing impairment of a waterbody have their greatest potential for adverse effects.

Daily discharge: the "discharge of a pollutant" measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily average" is calculated as the average.

Designated Use: use specified in water quality standards for each waterbody or segment regardless of actual attainment.

Discharge monitoring report: report of effluent characteristics submitted by a NPDES Permitted facility.

Effluent standards and limitations: all State or Federal effluent standards and limitations on quantities, rates, and concentrations of chemical, physical, biological, and other constituents to which a waste or wastewater discharge may be subject under the Federal Act or the State law. This includes, but is not limited to, effluent limitations, standards of performance, toxic effluent standards and prohibitions, pretreatment standards, and schedules of compliance.

Effluent: treated wastewater flowing out of the treatment facilities.

Geometric mean: the *n*th root of the product of *n* numbers. A 30-day geometric mean is the 30th root of the product of 30 numbers.

Impaired Waterbody: any waterbody that does not attain water quality standards due to an individual pollutant, multiple pollutants, pollution, or an unknown cause of impairment.

Land Surface Runoff: water that flows into the receiving stream after application by rainfall or irrigation. It is a transport method for nonpoint source pollution from the land surface to the receiving stream.

Load allocation (LA): the portion of a receiving water's loading capacity attributed to or assigned to nonpoint sources (NPS) or background sources of a pollutant.

Loading: the total amount of pollutants entering a stream from one or multiple sources.

Nonpoint Source: pollution that is in runoff from the land. Rainfall, snowmelt, and other water that does not evaporate become surface runoff and either drains into surface waters or soaks into the soil and finds its way into groundwater. This surface water may contain pollutants that come from land use activities such as agriculture; construction; silviculture; surface mining; disposal of wastewater; hydrologic modifications; and urban development.

NPDES permit: an individual or general permit issued by the Mississippi Environmental Quality Permit Board pursuant to regulations adopted by the Mississippi Commission on Environmental Quality under Mississippi Code Annotated (as amended) §§ 49-17-17 and 49-17-29 for discharges into State waters.

pH: a measure of acidity and alkalinity of a solution that is a number on a scale on which a value of 7 represents neutrality and lower numbers indicate increasing acidity and higher number increasing alkalinity and on which each unit of change represents a tenfold change in acidity or alkalinity and that is the negative logarithm of the effective hydrogen-ion concentration or hydrogen-ion activity in gram equivalents per liter of the solution.

Point Source: pollution loads discharged at a specific location from pipes, outfalls, and conveyance channels from either wastewater treatment plants or industrial waste treatment facilities. Point sources can also include pollutant loads contributed by tributaries to the main receiving stream.

Pollution: contamination, or other alteration of the physical, chemical, or biological properties, of any waters of the State, including change in temperature, taste, color, turbidity, or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive, or other substance, or leak into any waters of the State, unless in compliance with a valid permit issued by the Permit Board.

Publicly Owned Treatment Works (POTW): a waste treatment facility owned and/or operated by a public body or a privately owned treatment works which accepts discharges which would otherwise be subject to Federal Pretreatment Requirements.

Scientific Notation (Exponential Notation): mathematical method in which very large numbers or very small numbers are expressed in a more concise form. The notation is based on powers of ten. Numbers in scientific notation are expressed as the following: *4.16 x 10^(+b)* and *4.16 x 10^(-b) [same as 4.16E4 or4.16E-4]*. In this case, *b* is always a positive, real number. The *10^(+b)* tells us that the decimal point is *b* places to the right of where it is shown. The *10^(-b)* tells us that the decimal point is *b* places to the left of where it is shown.
For example: $2.7X10^{4} = 2.7E+4 = 27000$ and $2.7X10^{-4} = 2.7E-4 = 0.00027$.

Sigma (S): shorthand way to express taking the sum of a series of numbers. For example, the sum or total of three amounts 24, 123, 16, ($\mathbf{d}_1$, $\mathbf{d}_2$, $\mathbf{d}_3$) respectively could be shown as:

$$\sum_{i=1}^{3} d_i = d_1+d_2+d_3 = 24 + 123 + 16 = 163$$

Total Maximum Daily Load or TMDL: the calculated maximum permissible pollutant loading to a waterbody at which water quality standards can be maintained.

Regression Coefficient: an expression of the functional relationship between two correlated variables that is often empirically determined from data, and is used to predict values of one variable when given values of the other variable.

Waste: sewage, industrial wastes, oil field wastes, and all other liquid, gaseous, solid, radioactive, or other substances which may pollute or tend to pollute any waters of the State.

Wasteload allocation (WLA): the portion of a receiving water's loading capacity attributed to or assigned to point sources of a pollutant.

Water Quality Standards: the criteria and requirements set forth in *State of Mississippi Water Quality Criteria for Intrastate, Interstate, and Coastal Waters*. Water quality standards are standards composed of designated present and future most beneficial uses (classification of waters), the numerical and narrative criteria applied to the specific water uses or classification, and the Mississippi antidegradation policy.

Water quality criteria: elements of State water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports the present and future most beneficial uses.

Waters of the State: all waters within the jurisdiction of this State, including all streams, lakes, ponds, wetlands, impounding reservoirs, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, situated wholly or partly within or bordering upon the State, and such coastal waters as are within the jurisdiction of the State, except lakes, ponds, or other surface waters which are wholly landlocked and privately owned, and which are not regulated under the Federal Clean Water Act (33 U.S.C.1251 et seq.).

ABBREVIATIONS

7Q10.....Seven-Day Average Low Stream Flow with a Ten-Year Occurrence Period

BASINS..... Better Assessment Science Integrating Point and Nonpoint Sources

BMP .....Best Management Practice

CWA .....Clean Water Act

DMR.....Discharge Monitoring Report

EPA ..... Environmental Protection Agency

GIS .....Geographic Information System

HUC .....Hydrologic Unit Code

LA..... Load Allocation

MARIS ..... State of Mississippi Automated Information System

MDEQ ..... Mississippi Department of Environmental Quality

MOS..... Margin of Safety

NRCS ..... National Resource Conservation Service

NPDES .....National Pollution Discharge Elimination System

NPSM.....Nonpoint Source Model

RF3.....Reach File 3

USGS.....United States Geological Survey

WLA.....Waste Load Allocation

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Appendix A

The following table lists the NPDES Permits currently in the EPA Permit Compliance System (PCS). These permits and limits contained herein are for permitted facilities in the Big Black River Basin.

NPDES Facilities in the Big Black River Basin

NPDES	FACILITY NAME	COUNT	DISCHARGE STREAM	EFFLUENT STREAM
MS0000795	BURROWS PAPER CORPORATION	HOLMES	BIG BLACK RIVER	T.PROCESS DISCH./NONCONTACT WA
MS0020001	KILMICHAEL POTW	MONTGOMERY	UNNAMED TRIB OF BIG BLACK RIVER	TREATED DOMESTIC WASTEWATER
MS0020478	BENTONIA POTW	YAZOO	BIG BLACK RIVER	TREATED DOMESTIC WASTERWATER
MS0021024	WINONA POTW	MONTGOMERY	HAYS CREEK	TREATED DOMESTIC WASTEWATER
MS0021024	WINONA POTW	MONTGOMERY	HAYS CREEK	TREATED DOMESTIC WASTEWATER
MS0021032	BOLTON POTW	HINDS	BAKER CREEK	TREATED DOMESTIC WASTEWATER
MS0021130	PICKENS POTW	HOLMES	BIG BLACK RIVER	TREATED DOMESTIC WASTEWATER
MS0021164	CLINTON POTW - NORTHEAST	HINDS	STRAIGHT FENCE CREEK	TREATED DOMESTIC WASTEWATER
MS0021172	CLINTON SOUTHEST	HINDS	BAKER'S CREEK	TREATED DOMESTIC WASTEWATER
MS0021199	CLINTON POTW - SOUTH CENTRAL	HINDS	BAKERS CREEK	TREATED DOMESTIC WASTEWATER
MS0021504	VAIDEN POTW	CARROLL	HURRICANE CREEK	MONTHLY MASS/FLOW TOTALS
MS0022250	COUNTRY OAKS MOBILE HOME PARK	HINDS	BAKERS CREEK	EFFLUENT
MS0022250	COUNTRY OAKS MOBILE HOME PARK	HINDS	BAKERS CREEK	EFFLUENT
MS0023116	MATHISTON POTW	WEBSTER	PIGEON ROOST CREEK	TREATED DOMESTIC WASTEWATER
MS0023230	CLINTON POTW - LOVETT	HINDS	STRAIGHT FENCE CREEK	TREATED DOMESTIC WASTEWATER
MS0025003	PRVWSD/LAKE HARBOR	MADISON	CANE CREEK	TREATED DOMESTIC WASTEWATER
MS0025119	FLORA POTW	MADISON	TOWN CREEK	TREATED DOMESTIC WASTEWATER
MS0025852	RAYMOND POTW - EAST	HINDS		TREATED DOMESTIC WASTEWATER
MS0025852	RAYMOND POTW - EAST	HINDS		TREATED DOMESTIC WASTEWATER
MS0025917	RAYMOND POTW - WEST	HINDS		TREATED DOMESTIC WASTEWATER
MS0026921	GOODMAN POTW	HOLMES		TREATED DOMESTIC WASTEWATER
MS0027324	HOLMES COUNTY STATE PARK	HOLMES	BOX CREEK	EFFLUENT
MS0027324	HOLMES COUNTY STATE PARK	HOLMES	BOX CREEK	EFFLUENT
MS0027324	HOLMES COUNTY STATE PARK	HOLMES	BOX CREEK	EFFLUENT - MONTHLY
MS0027324	HOLMES COUNTY STATE PARK	HOLMES	BOX CREEK	EFFLUENT - MONTHLY
MS0027863	UTICA POTW - NORTH	HINDS		TREATED DOMESTIC WASTEWATER
MS0028631	INTERNATIONAL PAPER CO	MADISON	BATCHELOR CREEK	OVERFLOW FROM LOG SPRAY POND
MS0030295	JACKSON POTW	HINDS	BOGUE CHITTO CREEK	TREATED DOMESTIC WASTEWATER
MS0031208	JACKSON INDUSTRIAL DEVELOPMENT	HINDS	FOURTEEN MILE CREEK	WASTEWATER DISCHARGE
MS0031208	JACKSON INDUSTRIAL DEVELOPMENT	HINDS	FOURTEEN MILE CREEK	WASTEWATER DISCHARGE
MS0032816	WEST POTW	HOLMES	BIG BLACK RIVER	TREATED DOMESTIC WASTEWATER
MS0033081	WEST MADISON UTILITY DISTRICT	MADISON	BIG BLACK RIVER	
MS0033081	WEST MADISON UTILITY DISTRICT	MADISON	BIG BLACK RIVER	TREATED EFFLUENT
MS0034886	AIR LIQUIDE AMERICA CORP	MADISON	BEAR CREEK	COOLING TOWER BLOWDOWN
MS0034886	AIR LIQUIDE AMERICA CORP	MADISON	BEAR CREEK	TREATED TRUCKWASH WASTEWATER
MS0036277	GULF STATES CANNERS INC	HINDS	LITTLE BAKERS CREEK	TREATED PROCESS & SANITARY WW
MS0036374	EDWARDS POTW - WEST	HINDS	BIG BLACK RIVER	TREATED DOMESTIC WASTEWATER
MS0036382	EDWARDS POTW - SOUTHEAST	HINDS	BAKERS CREEK	TREATED DOMESTIC WASTEWATER

MS0036510	MDOT I-55 S REST AREA-CARROLL	CARROLL	POACHAHALA CREEK	TOTAL FACILITY OUTFALL
MS0036510	MDOT I-55 S REST AREA-CARROLL	CARROLL	POACHAHALA CREEK	TOTAL FACILITY OUTFALL
MS0036510	MDOT I-55 S REST AREA-CARROLL	CARROLL	POACHAHALA CREEK	EFFLUENT - MONTHLY
MS0036510	MDOT I-55 S REST AREA-CARROLL	CARROLL	POACHAHALA CREEK	EFFLUENT - MONTHLY
MS0036641	MDOT I-55 N REST AREA - HOLMES	HOLMES	JORDAN CREEK	EFFLUENT - MONTHLY
MS0036641	MDOT I-55 N REST AREA - HOLMES	HOLMES	JORDAN CREEK	EFFLUENT - MONTHLY
MS0037257	SANSING MEAT SERVICE-MABEN	CHOCTAW	PIGEON ROOST CANAL	DISCHARGE FROM FINAL LAGOON
MS0042447	EUP0RA POTW	WEBSTER	LITTLE BLACK CREEK CANAL	QUARTERLY MASS TOTALS & CONC
MS0042455	CANTON HCR SITE	MADISON	BEAR CREEK	NORTH HCR FIELD
MS0042455	CANTON HCR SITE	MADISON	BEAR CREEK	SOUTHWEST HCR FIELD
MS0042455	CANTON HCR SITE	MADISON	BEAR CREEK	SOUTH HCR FIELD
MS0042501	WALTHALL POTW	WEBSTER	HAYES CREEK	TREATED DOMESTIC WASTEWATER
MS0042811	BOVINA ELEMENTARY SCHOOL	WARREN	CLEAR CREEK	DISCHARGE FROM OUTFALL 001A
MS0042811	BOVINA ELEMENTARY SCHOOL	WARREN	CLEAR CREEK	DISCHARGE FROM OUTFALL 001A
MS0042811	BOVINA ELEMENTARY SCHOOL	WARREN	CLEAR CREEK	EFFLUENT - MONTHLY
MS0042811	BOVINA ELEMENTARY SCHOOL	WARREN	CLEAR CREEK	EFFLUENT - MONTHLY
MS0043401	LAKE LORMAN POTW	HINDS	LIMEKILN CREEK	TREATED DOMESTIC WASTEWATER
MS0043401	LAKE LORMAN POTW	HINDS	LIMEKILN CREEK	TREATED DOMESTIC
MS0044075	FRENCH CAMP POTW	CHOCTAW	POPLAR CREEK	TREATED DOMESTIC WASTEWATER
MS0044202	CERES INDUSTRIAL INTERPLEX	WARREN	BIG BLACK RIVER	TOTAL FACILITY OUTFALL
MS0044202	CERES INDUSTRIAL INTERPLEX	WARREN	BIG BLACK RIVER	TOTAL FACILITY OUTFALL
MS0044202	CERES INDUSTRIAL INTERPLEX	WARREN	BIG BLACK RIVER	TOTAL FACILITY OUTFALL
MS0045691	INTERNATIONAL PAPER CO	HOLMES	INDIAN CREEEK	OVERFLOW FROM LOG SPRAY
MS0045713	J A LACOUR & COMPANY	MADISON	BACHELOR CREEK	CONDENSATE & BOILER BLOWDOWN
MS0045896	CLINTON POTW - SOUTHWEST	HINDS	LINDSEY CREEK	TREATED DOMESTIC WASTEWATER
MS0046094	MDOT HWY 49 REST AREA - HINDS	HINDS	LIME KILN CREEK	TREATED DOMESTIC WASTEWATER
MS0046094	MDOT HWY 49 REST AREA - HINDS	HINDS	LIME KILN CREEK	TREATED DOMESTIC WASTEWATER
MS0046094	MDOT HWY 49 REST AREA - HINDS	HINDS	LIME KILN CREEK	EFFLUENT - MONTHLY
MS0046094	MDOT HWY 49 REST AREA - HINDS	HINDS	LIME KILN CREEK	EFFLUENT - MONTHLY
MS0046205	MEMPHIS HARDWOOD FLOORING CO	HOLMES	BIG BLACK RIVER	OVERFLOW FROM LOG-SPRAY POND
MS0046213	MEMPHIS HARDWOOD FLOORING CO	YAZOO	TOWN CREEK	OVERFLOW FROM LOG-SPRAY POND
MS0046213	MEMPHIS HARDWOOD FLOORING CO	YAZOO	TOWN CREEK	WELL WATER OVERFLOW
MS0046345	SOUTHERN VITAL DATAPLEX	MADISON	TRIBUTARY OF BIG BLACK RIVER	TOTAL FACILITY DISCHARGE
MS0046451	CANTON POTW - LAKE CAROLINE NE	MADISON	PANTHER CREEK	TREATED DOMESTIC WASTEWATER
MS0046469	CANTON POTW - LAKE CAROLINE SW	MADISON	PERSIMMON CREEK	MONTHLY DISCHARGE
MS0047619	CLINTON BRIARS BIOLAC	HINDS	UN CREEK - BOGUE CHITTO CREEK	TREATED DOMESTIC WASTEWATER
MS0048127	DURANT POTW	HOLMES	BIG BLACK RIVER	TREATED DOMESTIC WASTEWATER
MS0048127	DURANT POTW	HOLMES	BIG BLACK RIVER	TREATED DOMESTIC WASTEWATER
MS0049093	PREMIUM TANK LINES INC	WARREN		VEHICLE WASHING WASTEWATER

MS0049221	ERGON TRUCKING INCORPORATED	HOLMES		TRUCK WASH WATER & STORMWATER
MS0049492	R & S SWINE FARM	ATTALA	DRY CREEK	STORMWATER OFF APPL FIELDS
MS0049603	DJ'S FARMS	WEBSTER	PATT'S BRANCH	STORMWATER DISCHARGE APP FIELD
MS0049913	HANKINS LUMBER COMPANY INC	MONTGOMERY	UNNAMED TRIB HAYS CREEK	VEHICLE WASHING WASTEWATER
MS0049999	JOAMCA CHEMICAL PRODUCTS INC	MADISON	UNNAMED TRIBUTARY	TANK AND FLOOR RINSE WATER
MS0050521	PUMP AND SAVE #738	HINDS		TREATED GROUNDWATER
MS0050679	LARRY C BURTON SWINE	CHOCTAW	CRAPE CREEK	STORMWATER OFF APPL FIELDS
MS0050687	TOMMY GLANDNEY SWINE FACILITY	CHOCTAW	UNNAMED TRIB OF BIG BLACK RIVER	STORMWATER OFF APPL FIELDS
MS0050806	ROBERSON ENTERPRIES	WEBSTER	MOORES CREEK	STORMWATER RUNOFF APPL FIELDS
MS0050920	VAN JOHNSON SWINE FARM #2	WEBSTER	RILLIN CREEK	STORMWATER RUNOFF APPL FIELDS
MS0051292	ALZO NOBEL COATINGS INC	HINDS	LITTLE BAKERS CREEK	NON CONTACT COOLING WATER
MS0051438	MALLARD LAKE UTILITIES INC	HINDS	FOURTEEN MILE CREEK	EFFLUENT - MONTHLY
MS0051438	MALLARD LAKE UTILITIES INC	HINDS	FOURTEEN MILE CREEK	EFFLUENT - MONTHLY
MS0051772	RAYMOND POTW - BIOLAC WWTF	HINDS		TREATED DOMESTIC WASTEWATER
MS0051896	GEORGIA PACIFIC CORPORATION	WEBSTER	PIGEON ROOST CREEK	OVERFLOW FROM RECIRC. POND
MS0052051	JERRY MILNER SWINE FACILITY	MONTGOMERY	TRIB OF BIG BLACK RIVER CANAL	STORMWATER RUNOFF APPL FIELDS
MS0052311	CHARLES DONALD PULPWOOD INC	HOLMES	BIG BLACK RIVER	LOG SPRAY RECIRCULATION POND
MS0054046	MISSISSIPPI LIGNITE MINING CO	CHOCTAW	LITTY BYWY & MIDDLE BYWY	STORM WATER - ACTIVE AREAS
MS0054046	MISSISSIPPI LIGNITE MINING CO	CHOCTAW	LITTY BYWY & MIDDLE BYWY	STORM WATER - ACTIVE AREAS
MS0054046	MISSISSIPPI LIGNITE MINING CO	CHOCTAW	LITTY BYWY & MIDDLE BYWY	STORM WATER - ACTIVE AREAS
MS0054046	MISSISSIPPI LIGNITE MINING CO	CHOCTAW	LITTY BYWY & MIDDLE BYWY	STORM WATER - ACTIVE AREAS
MS0054046	MISSISSIPPI LIGNITE MINING CO	CHOCTAW	LITTY BYWY & MIDDLE BYWY	STORM WATER - ACTIVE AREAS
MS0054046	MISSISSIPPI LIGNITE MINING CO	CHOCTAW	LITTY BYWY & MIDDLE BYWY	STORM WATER - ACTIVE AREAS
MS0054046	MISSISSIPPI LIGNITE MINING CO	CHOCTAW	LITTY BYWY & MIDDLE BYWY	STORM WATER - ACTIVE AREAS
MS0054046	MISSISSIPPI LIGNITE MINING CO	CHOCTAW	LITTY BYWY & MIDDLE BYWY	STORM WATER - ACTIVE AREAS
MS0054046	MISSISSIPPI LIGNITE MINING CO	CHOCTAW	LITTY BYWY & MIDDLE BYWY	STORM WATER - ACTIVE AREAS
MS0054046	MISSISSIPPI LIGNITE MINING CO	CHOCTAW	LITTY BYWY & MIDDLE BYWY	TREATED SANITARY WASTEWATER
MSS050598	DURANT SANITARY LANDFILL	HOLMES	TRIBUTARY OF INDIAN CREEK	GRAB SAMPLING
MSS050598	DURANT SANITARY LANDFILL	HOLMES	TRIBUTARY OF INDIAN CREEK	COMPOSITE SAMPLING