Jarbo Bayou:
A Community Project to Protect Recreational Uses

One Total Maximum Daily Load for Bacteria in Jarbo Bayou[1]

Adopted January 24, 2018.

Approved by EPA March 29, 2018.

One Total Maximum Daily Load for Indicator Bacteria in Jarbo Bayou Added by this Addendum I, April 2024

Via the April 2024 Update to the Texas Water Quality Management Plan (SFR-121/2024-03).

Approved by EPA July 15, 2024 (scroll to view or print this addendum).

[1] https://www.tceq.texas.gov/downloads/water-quality/tmdl/houston-galveston-recreational-42/106-jarbo-bayou-bacteria-tmdl-adopted.pdf

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Appendix IV. Addendum One to One Total Maximum Daily Load for Bacteria in Jarbo Bayou

Adding one TMDL for AU 2425B_02

One TMDL for Indicator Bacteria in Jarbo Bayou

Introduction

TCEQ adopted *One Total Maximum Daily Load for Bacteria in Jarbo Bayou* (TCEQ, 2018a) on January 24, 2018. The United States (U.S.) Environmental Protection Agency (EPA) approved the TMDL on March 29, 2018. This document is the first addendum to the original TMDL report.

This first addendum includes information specific to one additional assessment unit (AU) for Jarbo Bayou AU 2425B_02. This AU is located within the watershed of the approved original TMDL for Jarbo Bayou. The concentration of indicator bacteria in this additional AU exceeds the criterion used to evaluate support of the primary contact recreation 1 use.

This addendum details the development of the added TMDL allocation for this additional AU, which was not specifically addressed in the original TMDL report. For background or other explanatory information, please refer to the *Technical Support Document for One Total Maximum Daily Load for Indicator Bacteria in Jarbo Bayou*[2] (Adams and Millican, 2024). Refer to the original, approved TMDL document for details about the overall project watershed as well as methods and assumptions used in developing the original TMDL.

Problem Definition

TCEQ first identified the bacteria impairment within Jarbo Bayou AU 2425B_02 in the EPA-approved 2022 edition of the *Texas Integrated Report of Surface Water Quality for the Clean Water Act Sections 305(b) and 303(d)* (Texas Integrated Report; TCEQ, 2022). The water body includes only two AUs. The downstream AU 2425B_01 was included as part of the original TMDL. Figure IV-1 shows the watershed added in this addendum in relation to the entire watershed of the original TMDL.

[2] https://www.tceq.texas.gov/downloads/water-quality/tmdl/houston-galveston-recreational-42/as-489_jarbo-bayou-draft-tsd.pdf

The Texas Surface Water Quality Standards (TCEQ, 2022b) identifies uses for surface waters and numeric and narrative criteria to evaluate attainment of those uses. The basis for the water quality target for the TMDL developed in this addendum is the numeric criterion for indicator bacteria from the 2022 Texas Surface Water Quality Standards. Enterococci is the indicator bacteria for assessing primary contact recreation 1 use in saltwater.

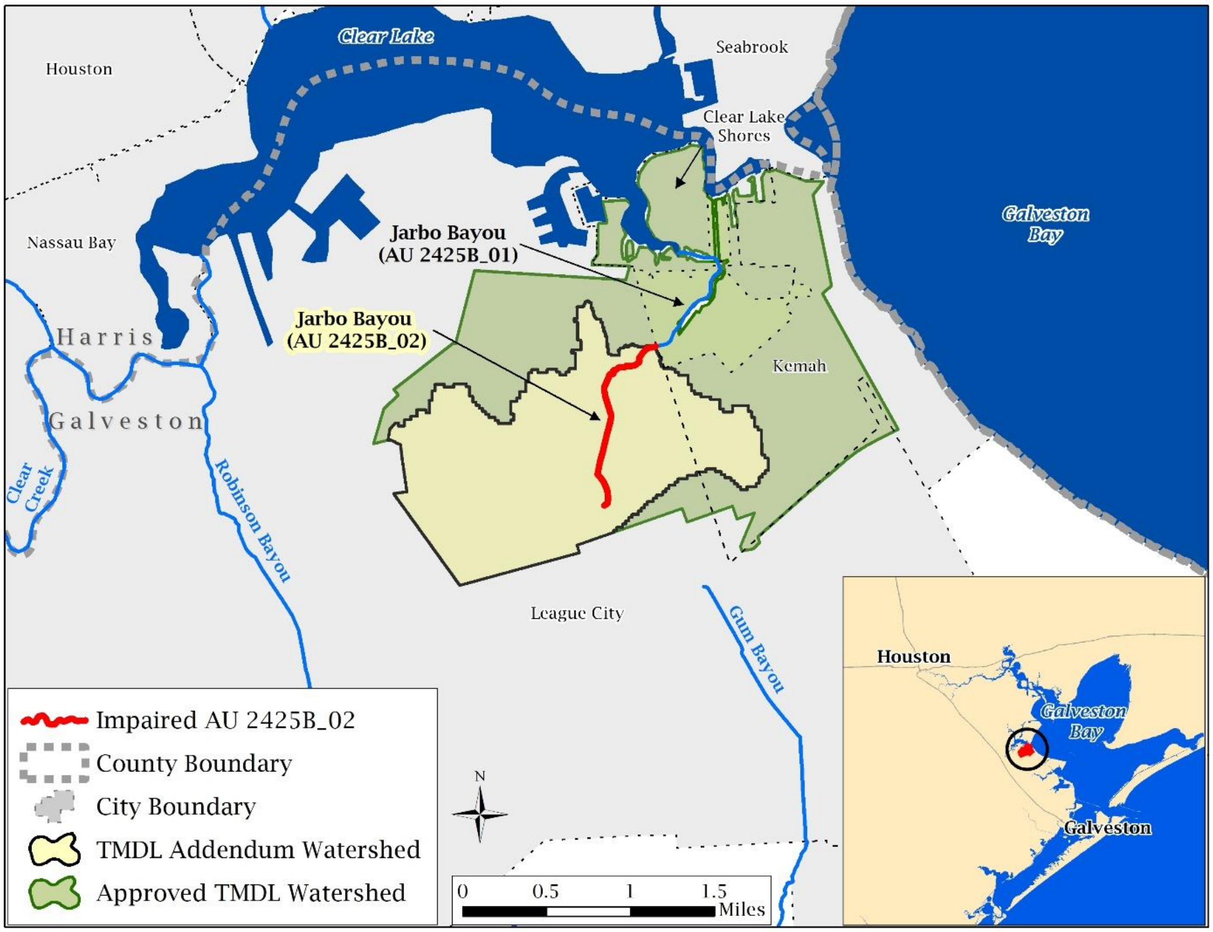

Figure IV-1. Map showing the previously approved TMDL watershed and the Jarbo Bayou AU 2425B_02 watershed added by this addendum

Table IV-1 summarizes the ambient water quality data for the TCEQ surface water quality monitoring (SWQM) station in the water body, as reported in the 2022 Texas Integrated Report (TCEQ, 2022). The data from the assessment indicate nonsupport of the primary contact recreation 1 use for the AU, because the geometric mean concentration for Enterococci exceeds the saltwater geometric mean criterion of 35 colony forming units per 100 milliliters (cfu/100 mL) of water. Figure IV-2 shows the location of the TCEQ SWQM station that was used in evaluating water quality in the 2022 Texas Integrated Report for the water body added by this addendum.

Table IV-1. 2022 Texas Integrated Report summary

AU	TCEQ SWQM Station	Parameter	Number of Samples	Date Range	Enterococci Geometric Mean (cfu/100 mL)
2425B_02	16485	Enterococci	22	12/1/13 – 11/30/20	126.96

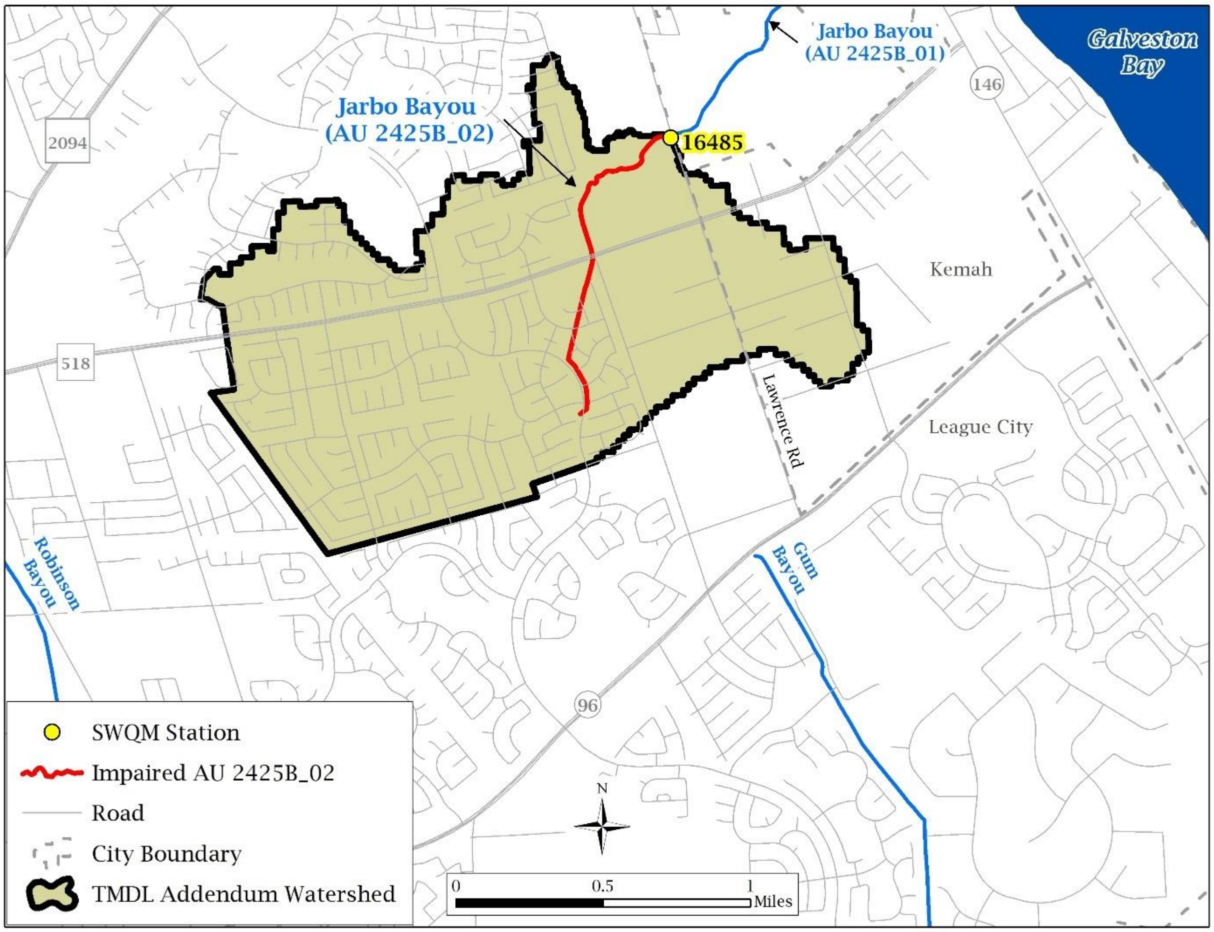

Figure IV-2. Active TCEQ SWQM station

Watershed Overview

The TMDL watershed (AU 2425B_02) is located within the Jarbo Bayou (2425B) watershed in the southeastern portion of the "Greater Houston" metropolitan area and entirely within Galveston County. Influenced by seawater from Galveston Bay, Jarbo Bayou begins approximately 0.67 miles upstream of Farm-to-Market 518 and flows 1.61 miles to the outlet at Clear Lake, which feeds into Galveston Bay. Jarbo Bayou consists of two AUs (2425B_01 and 2425B_02).

The 2022 Texas Integrated Report (TCEQ, 2022) has the following water body and AU descriptions:

- Jarbo Bayou (2425B) –From Clear Lake confluence with Clear Lake to 1.1 kilometers (0.67 miles) upstream of Farm-to-Market 518 in Galveston County.
  - AU 2425B_01 - From the Clear Lake confluence upstream to Lawrence Road
  - AU 2425B_02 - From Lawrence Road to the headwaters 1.1 kilometers (0.67 miles) upstream of Farm-to-Market 518

Climate

The TMDL watershed is within the Upper Coast climatic division, categorized as subtropical humid (Larkin and Bomar, 1983). The Gulf of Mexico is the principal source of moisture that drives precipitation in the region. Weather data were obtained for the 10-year period from January 2013 through December 2022 from the National Oceanic and Atmospheric Administration (NOAA) National Center for Environmental Information for the Houston National Weather Service Office located in League City (NOAA, 2023). Data from this 10-year period indicate that the average high temperatures typically peak in August (92.2 °F). During winter, the average low temperature generally reaches a minimum of 44.4 °F in January (Figure IV-3). Annual rainfall averages 64.2 inches. The wettest month was August (9.9 inches) while February (2.3 inches) was the driest month, with rainfall occurring throughout the year.

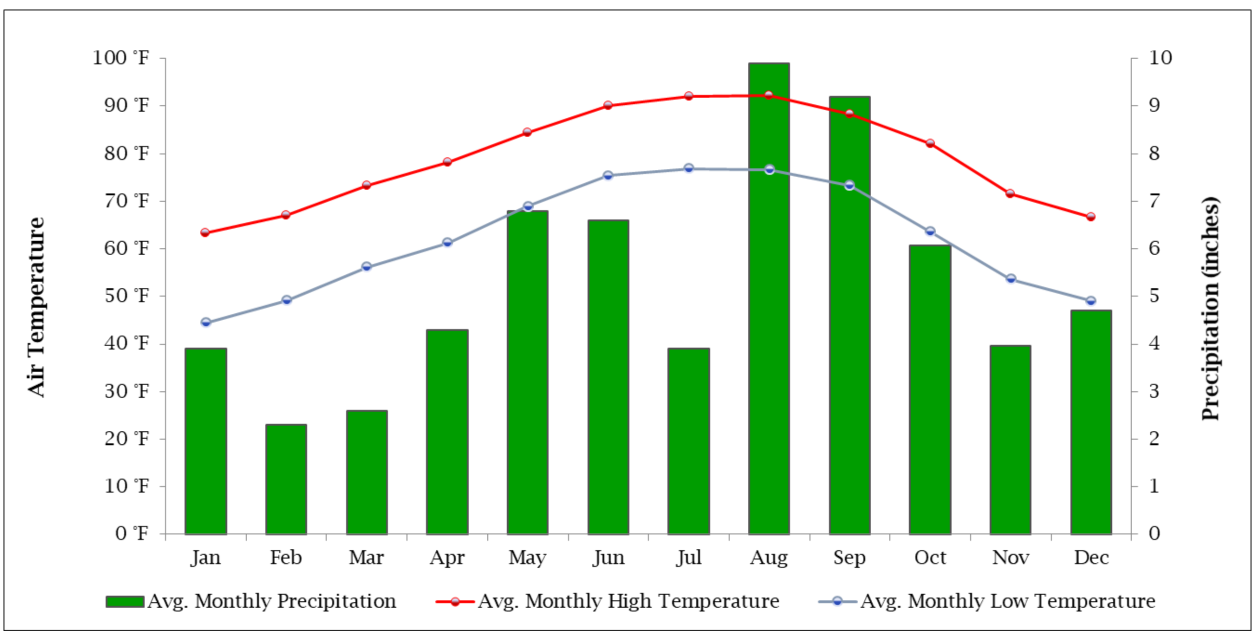

Figure IV-3. Average monthly temperature and precipitation (2013-2022) at the Houston National Weather Service Office

Population and Population Projections

The TMDL watershed is located within Galveston County. Current predominant population densities for this watershed are located in League City and Kemah. According to the 2020 U.S. Census Bureau (USCB), the addendum TMDL watershed had an estimated population of 8,137 people in 2020 (USCB, 2022).

A population projection through 2045 was estimated from the Houston-Galveston Area Council (H-GAC) Regional Growth Forecast data (H-GAC, 2018). The forecast includes population projections for transportation analysis zones (TAZ), which are planning areas used by H-GAC to provide analyses at a local scale. Table IV-2 provides a summary of the population projection for the added TMDL watershed.

Table IV-2. 2020 – 2045 population projection

Area	2020 Estimated Population	2045 Projected Population	Projected Population Increase	Percent Change
Jarbo Bayou	8,137	8,508	371	4.56%

The following steps detail the method used to estimate the 2020 and projected 2045 populations in the TMDL watershed.

1. Obtained 2020 USCB data at the block level.
2. Developed the 2020 watershed population using the USCB block level data for the portions of census blocks within the TMDL watershed.
3. For the census blocks that were partially located in the watershed, estimated population by multiplying the block population to the proportion of its area in the watershed. Summed the results of blocks located wholly and/or partially within the watershed to obtain the 2020 population for the TMDL watershed.
4. Obtained the 2018 H-GAC Regional Growth Forecast (tabular data) and associated TAZs (spatial data) to be used for population projections (H-GAC, 2018).
5. Joined population data for each TAZ in a geographic information system and located the relevant TAZs within the watershed.
6. For the TAZs that were partially located in the watershed, estimated population projections by multiplying the TAZ population to the proportion of its area in the watershed. Summed the results of TAZs located wholly and/or partially within the watershed to obtain the 2045 population projections.
7. Subtracted the 2020 watershed population (Step 4) from the 2045 population projection (Step 6) to determine the projected population increase. Subsequently, divided the projected population increase by the 2020 watershed population to determine the percentage population increase for the TMDL watershed.

Land Cover

The land cover data for the TMDL watershed were obtained from the U.S. Geological Survey (USGS) 2019 National Land Cover Database (NLCD) (USGS, 2021). The land cover for the addendum TMDL watershed is shown in Figure IV-4. A summary of the land cover data is provided in Table IV-3 and indicates that the addendum TMDL watershed is mostly Developed (Medium Intensity 58.13%, Low Intensity 19.18%, Open Space 10.28%, and High Intensity 9.74%).

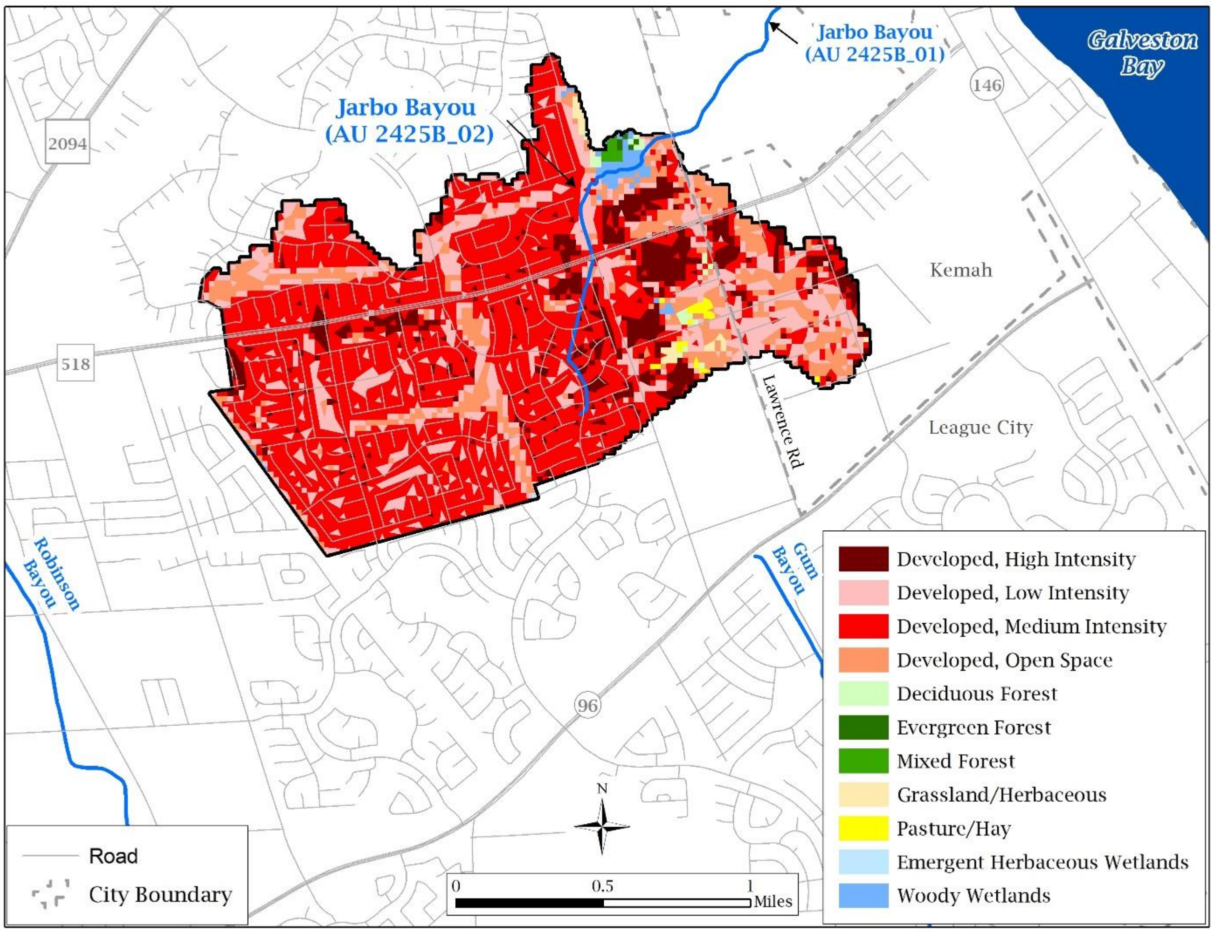

Figure IV-4. Land cover map showing classifications

Table IV-3. Land cover classification by area and percentage

2019 NLCD Classifications	Area (Acres)	% of Total
Developed, High Intensity	119.00	9.74%
Developed, Low Intensity	234.32	19.18%

2019 NLCD Classifications	Area (Acres)	% of Total
Developed, Medium Intensity	710.31	58.13%
Developed, Open Space	125.60	10.28%
Deciduous Forest	5.03	0.41%
Evergreen Forest	1.08	0.09%
Mixed Forest	2.71	0.22%
Grassland/Herbaceous	6.12	0.50%
Pasture/Hay	4.90	0.40%
Emergent Herbaceous Wetlands	0.16	0.01%
Woody Wetlands	12.69	1.04%
Total	1,221.92	100%

Endpoint Identification

The endpoint for the TMDL is to maintain the concentration of Enterococci below the geometric mean criterion of 35 cfu/100 mL, which is protective of the primary contact recreation 1 use in saltwater.

Source Analysis

Pollutants may come from several sources, both regulated and unregulated. Pollutants in regulated discharges, referred to as “point sources,” come from a single definable point, such as a pipe, and are regulated by permit under the Texas Pollutant Discharge Elimination System (TPDES) program. Wastewater treatment facilities (WWTFs) and stormwater discharges from industries, construction activities, and the separate storm sewer systems of cities are considered point sources of pollution.

Unregulated sources are typically nonpoint source in origin, meaning the pollutants originate from multiple locations and rainfall runoff washes them into surface waters. Nonpoint sources are not regulated by permit.

Except for WWTFs, which receive individual wasteload allocations (WLAs; see the Wasteload Allocation section), the regulated and unregulated sources in this section are presented to give a general account of the different sources of bacteria expected in the watershed. These are not meant to be used for allocating bacteria loads or interpreted as precise inventories and loadings.

Regulated Sources

Regulated sources are controlled by permit under the TPDES program. The regulated sources in the TMDL watershed include sanitary sewer overflows (SSOs), stormwater discharges from regulated construction sites, and municipal separate storm sewer systems (MS4s).

Domestic and Industrial WWTFs

As of May 2023, there were no WWTFs with TPDES permits within the TMDL watershed.

TCEQ/TPDES Water Quality General Permits

Certain types of activities are required to be covered by one of several TCEQ/TPDES wastewater general permits:

- TXG110000 – concrete production facilities
- TXG130000 – aquaculture production
- TXG340000 – petroleum bulk stations and terminals
- TXG640000 – conventional water treatment plants
- TXG670000 – hydrostatic test water discharges
- TXG830000 – water contaminated by petroleum fuel or petroleum substances
- TXG870000 – pesticides (application only)
- TXG920000 – concentrated animal feeding operations
- WQG100000 – wastewater evaporation
- WQG200000 – livestock manure compost operations (irrigation only)

A review of active general permit coverage (TCEQ, 2023a) in the TMDL watershed, as of May 2023, found no active general permit authorizations.

Sanitary Sewer Overflows

A summary of SSO incidents that occurred during a sixyear period from 2016 through 2022 in Galveston County was obtained from TCEQ headquarters in Austin (TCEQ, 2023b). The summary data indicated that three SSO incidents had been reported within the TMDL watershed. The SSOs had a total discharge of 5,002 gallons with a minimum of one gallon and a maximum of 5,000 gallons.

TPDES-Regulated Stormwater

When evaluating stormwater for a TMDL allocation, a distinction must be made between stormwater originating from an area under a TPDES-regulated discharge permit and stormwater originating from areas not under a TPDES-regulated discharge permit. Stormwater discharges fall into two categories:

1. Stormwater subject to regulation, which is any stormwater originating from TPDES-regulated municipal separate storm sewer system (MS4) entities, stormwater discharges associated with regulated industrial facilities, and construction activities.
2. Stormwater runoff not subject to regulation.

Discharges of stormwater from a Phase II MS4 area, regulated industrial facility, construction area, or other facility involved in certain activities must be covered under the following TCEQ/TPDES general permits:

- TXR040000 – Phase II MS4 General Permit for MS4s located in urbanized areas
- TXR050000 – Multi-sector General Permit (MSGP) for industrial facilities
- TXR150000 – Construction General Permit (CGP) for construction activities disturbing more than one acre or are part of a common plan of development disturbing more than one acre

A review of active stormwater general permit authorizations (TCEQ, 2023a) in the TMDL watershed found one combined Phase I/ II MS4 permit authorization, two Phase II MS4 permit authorizations, and four CGP authorizations located within the TMDL watershed as of May 2023 (Table IV-4). The areas covered by the CGP authorizations are not discussed further, since MS4 permits cover 100% of the watershed (Figure IV-5).

Table IV-4. TPDES MS4 permits

Regulated Entity	TPDES Permit	EPA ID	Authorization Type
Texas Department of Transportation	WQ0005011000	TXS002101	Combined Phase I and II MS4
City of League City	TXR040249	N/A	Phase II MS4
City of Kemah	TXR040096	N/A	Phase II MS4

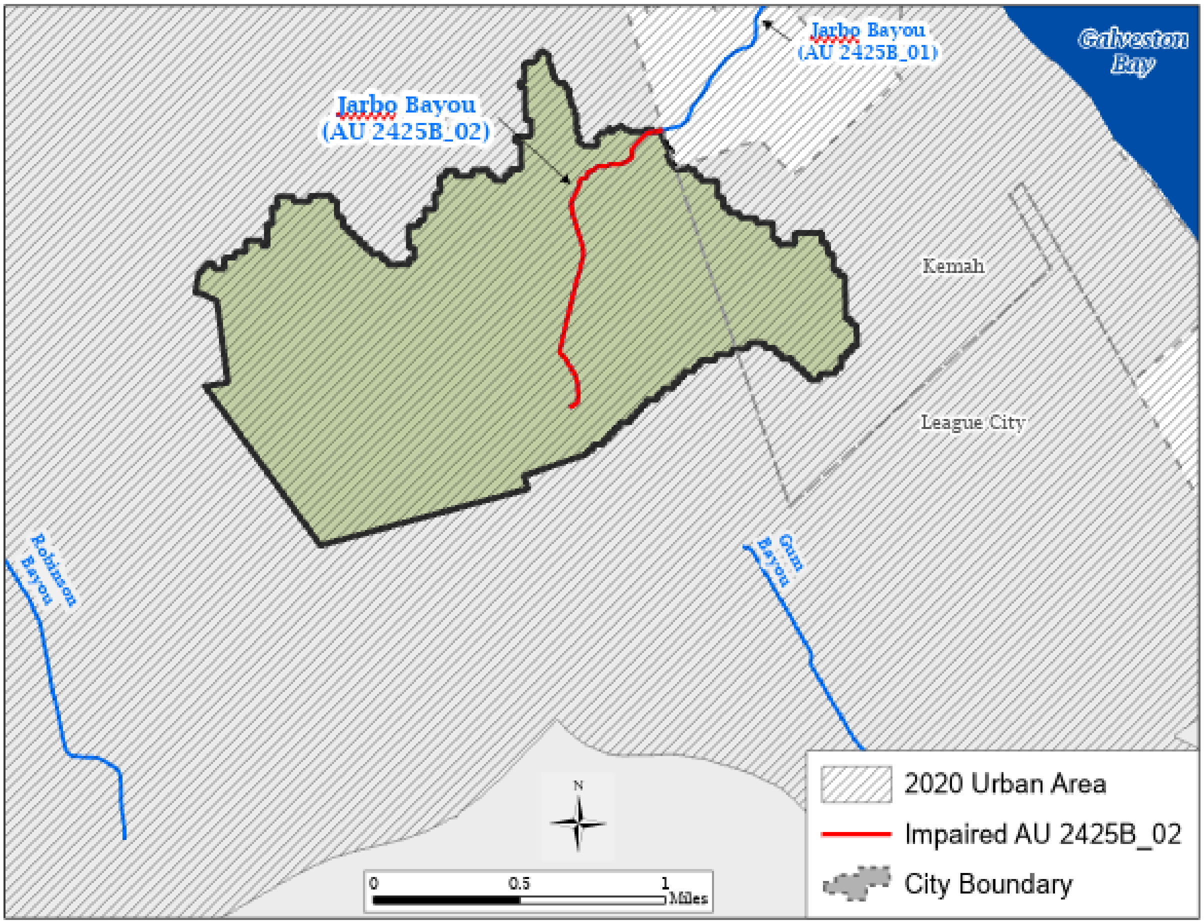

Figure IV-5. Regulated stormwater areas based on MS4 permit authorizations as defined by the urban area

Illicit Discharges

Pollutant loads can enter water bodies from MS4 outfalls that carry authorized sources as well as illicit discharges under both dry- and wet-weather conditions. The term "illicit discharge" is defined in TPDES General Permit TXR040000 for Phase II MS4s as "Any discharge to a municipal separate storm sewer system that is not entirely composed of stormwater, except discharges pursuant to this general permit or a separate authorization and discharges resulting from emergency firefighting activities." Illicit discharges can be categorized as either direct or indirect contributions.

Unregulated Sources

Unregulated sources of bacteria are nonpoint and can originate from wildlife and feral hogs, various agricultural activities, agricultural animals, land application fields, urban runoff not covered by a permit, failing on-site sewage facilities (OSSFs), and domestic pets.

Unregulated Agricultural Activities and Domesticated Animals

A number of agricultural activities that do not require permits can be potential sources of fecal bacteria loading. Agricultural activities were not a source in this highly urbanized watershed.

Fecal bacteria from dogs and cats is transported to water bodies by runoff in both urban and rural areas and can be a potential source of bacteria loading. Table IV-5 summarizes the estimated number of dogs and cats within the TMDL watershed. Pet population estimates were calculated as the estimated number of dogs (0.614) and cats (0.457) per household (AVMA, 2018). The number of households in the TMDL watershed was estimated using 2010 Census data (USCB, 2010). The actual contribution and significance of bacteria loads from pets reaching the TMDL water body is unknown.

Table IV-5. Estimated households and pet population

Estimated Households	Estimated Dog Population	Estimated Cat Population
2,877	1,767	1,315

Wildlife and Unmanaged Animals

Fecal bacteria are common inhabitants of the intestines of all warm-blooded animals, including wildlife such as mammals and birds. In developing bacteria TMDLs, it is important to identify by watershed the potential for bacteria contributions from wildlife. Wildlife are naturally attracted to riparian corridors of water bodies. With direct access to the stream channel, the direct deposition of wildlife waste can be a concentrated source of bacteria loading to a water body. Fecal bacteria from wildlife are also deposited onto land surfaces, where they may be washed into nearby water bodies by rainfall runoff.

The Enterococci contribution from feral hogs and wildlife in the TMDL watershed cannot be determined based on existing information. However, due to the watershed's urbanized nature, it is anticipated that the contribution would be minimal.

On-site Sewage Facilities

The estimated number of OSSFs in the TMDL watershed was determined using data supplied by H-GAC. Data from these sources indicate that there are approximately 10 OSSFs located within the TMDL watershed (Figure IV-6). Several pathways of the liquid waste in OSSFs afford opportunities for bacteria to enter ground and surface waters, if the systems are not properly operating. Properly designed and operated, however, OSSFs would be expected to contribute virtually no fecal bacteria to surface waters.

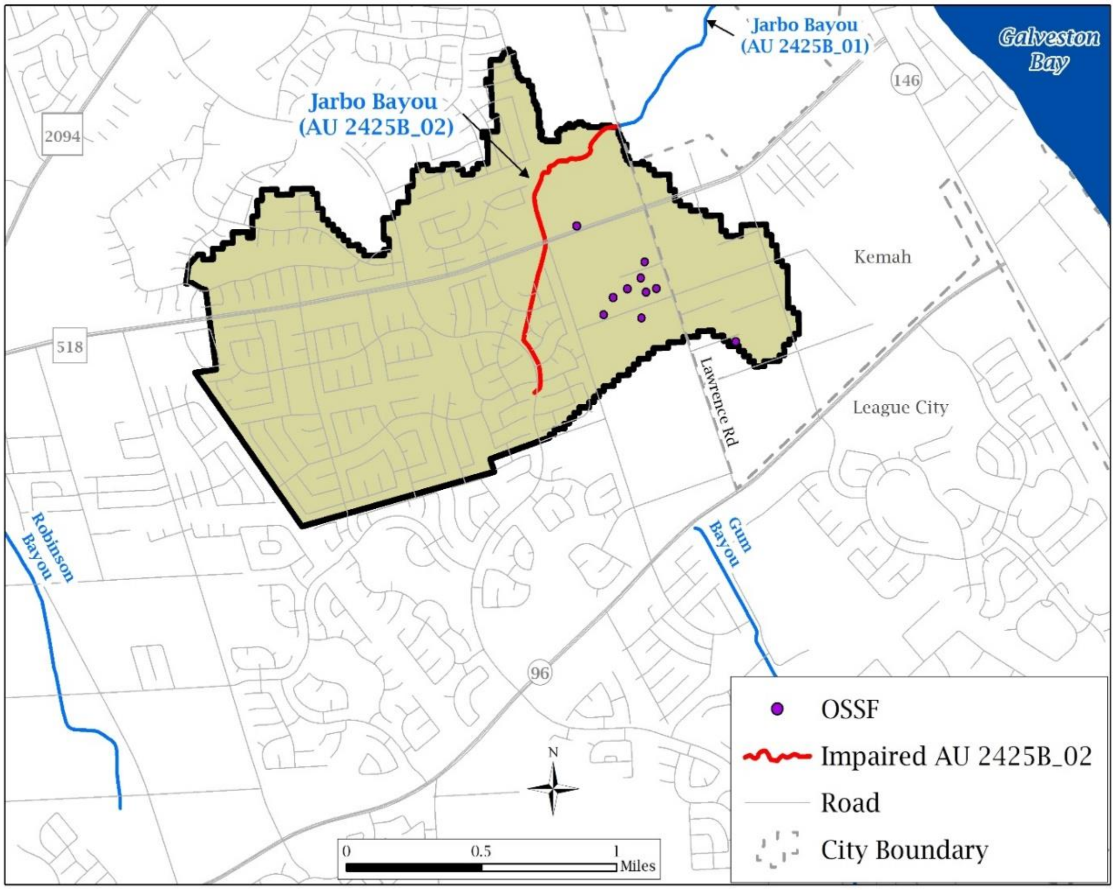

Figure IV-6. Estimated OSSFs located within the TMDL watershed

Linkage Analysis

The modified load duration curve (MLDC) method was used to examine the relationship between instream water quality and the source of indicator bacteria loads. Inherent to the use of MLDCs as the mechanism of linkage analysis is the assumption of a one-to-one relationship between instream loadings and loadings originating from point sources as regulated and from the landscape as unregulated sources. Further, this one-to-one relationship was also inherently assumed when using the MLDC to define the TMDL pollutant load allocation. The MLDC method allows for estimation of TMDL loads by utilizing the cumulative frequency distribution of streamflow and measured pollutant concentration data (Cleland, 2003) with adjustments to include tidal influences for the modified method (ODEQ, 2006). In addition to estimating stream loads, this method allows for the determination of the hydrologic conditions under which impairments are typically occurring, can give indications of the broad origins of the bacteria (i.e., point or nonpoint source), and provides a means to allocate allowable loadings. The technical support document for this addendum (Adams and Millican, 2024) provides details about the linkage analysis along with the MLDC method and its application.

The Enterococci event data plotted on the MLDC for TCEQ SWQM Station 16485 in Figure IV-7 shows exceedances of the geometric mean criterion have commonly occurred under all three flow regimes. The allowable load at the single sample criterion (130 cfu/100 mL) is included on the MLDC for comparison with individual Enterococci samples, although it is not used for assessment or allocation purposes.

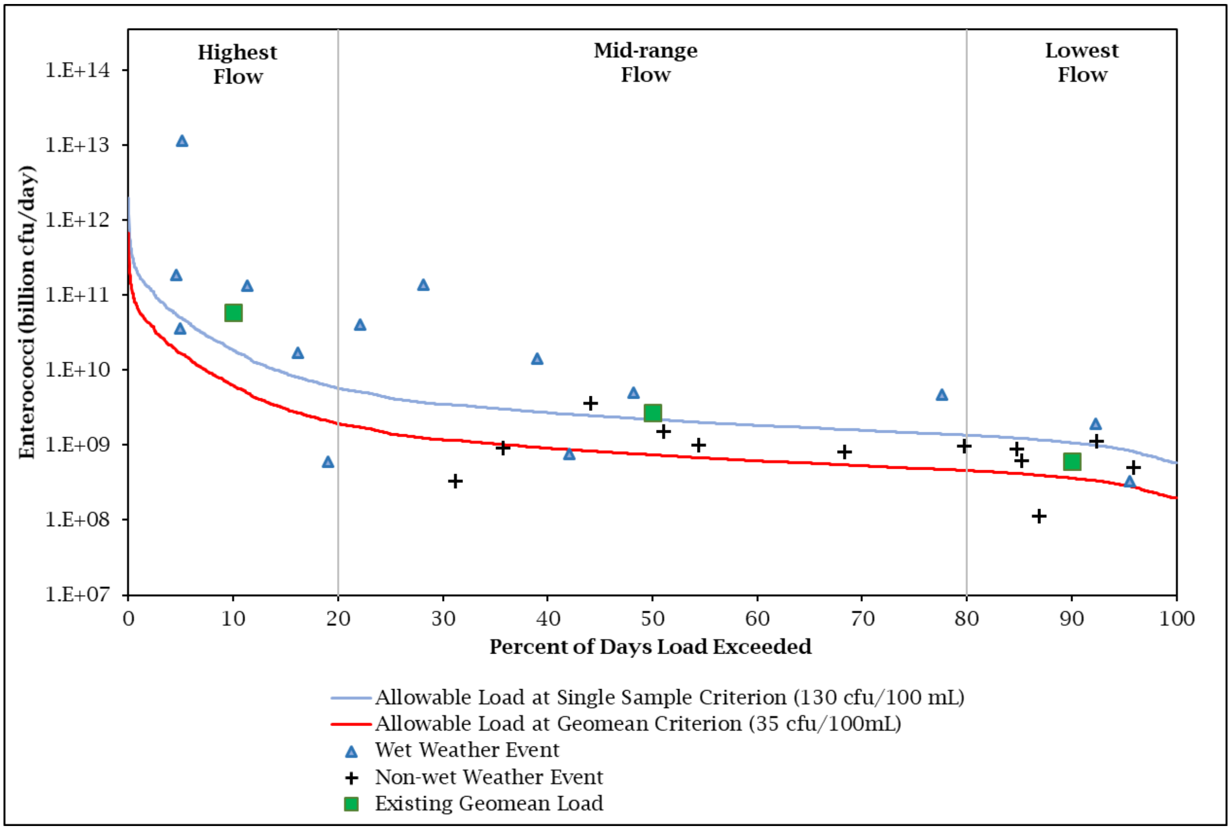

Figure IV-7. MLDC for TCEQ SWQM Station 16485

Margin of Safety

The margin of safety (MOS) is designed to account for any uncertainty that may arise in specifying water quality control strategies for the complex environmental processes that affect water quality. Quantification of this uncertainty, to the extent possible, is the basis for assigning an MOS. The TMDL in this report incorporates an explicit MOS of 5% of the total TMDL allocation.

Pollutant Load Allocation

The TMDL represents the maximum amount of a pollutant that the stream can receive in a single day without exceeding water quality standards. The pollutant load allocations for the selected scenarios were calculated using the following equation:

TMDL = WLA + LA + FG + MOS

Where:

WLA = wasteload allocations, the amount of pollutant allowed by regulated dischargers

LA = load allocations, the amount of pollutant allowed by unregulated sources

FG = loadings associated with future growth from potential regulated facilities

MOS = margin of safety load

For the remainder of this report, some calculations have been rounded and may not lead to the exact final amounts listed in the text, tables, or figures.

AU-Level TMDL Calculation

To be consistent with previously completed TMDLs in the original watershed, the TMDL for Jarbo Bayou AU 2425B_02 was derived using the median flow within the Highest flow regime (or 10% load duration exceedance) of the MLDC developed for TCEQ SWQM Station 16485. This station represents the location within the TMDL watershed where an adequate number of Enterococci samples were collected.

Margin of Safety Calculation

The TMDL in this report incorporates an explicit MOS of 5%.

Wasteload Allocation

The WLA is the sum of loads from regulated sources, which are WWTFs and regulated stormwater.

Wastewater Treatment Facilities

TPDES-permitted WWTFs are allocated a daily wasteload (WLA_{WWTF}) calculated as their full permitted discharge flow rate multiplied by an assigned instream geometric mean criterion. Due to the absence of any permitted dischargers in the TMDL watershed, the WLA_{WWTF} component is zero. In the event a WWTF is permitted in the TMDL watershed, the water quality criterion (23 cfu/100 mL) will be used as the WWTF target to provide instream and downstream load capacity, and to be consistent with the previously developed TMDL.

Regulated Stormwater

Stormwater discharges from MS4, industrial, and construction areas are also considered regulated point sources. Therefore, the WLA calculations must also include an allocation for regulated stormwater discharges (WLA_{SW}). The percentage of the land area included in the project watershed that is under the jurisdiction of stormwater permits is used to estimate the amount of the overall runoff load that should be allocated as the permitted stormwater contribution in the WLA_{SW} component.

The TMDL watershed is almost 100% covered by MS4 permits. However, even in highly urbanized areas such as the TMDL watershed, there remain some areas of potential direct deposition of bacteria loadings from unregulated sources, such as wildlife. To account for these unregulated areas, the stream length based on the TCEQ definition of AU 2425B_02 and average channel width as calculated based on recent aerial imagery was used to compute an area of unregulated stormwater contribution. The percentage of land under the jurisdiction of stormwater permits in the TMDL watershed is 99.7%.

Load Allocation

The load allocation (LA) component of the TMDL corresponds to direct nonpoint runoff and is the difference between the total load from stormwater runoff and the portion allocated to WLA_{SW}.

Allowance for Future Growth

The future growth (FG) component of the TMDL equation addresses the requirement of TMDLs to account for future loadings that might occur as a result of population growth, changes in community infrastructure, and development. Specifically, this TMDL component takes into account the probability that new flows from WWTF discharges may occur in the future. The assimilative capacity of water bodies increases as the amount of flow increases. The allowance for FG in this TMDL report will result in protection of existing uses and conform to Texas' antidegradation policy.

The FG component of the TMDL watershed was based on the population projections for the entire TMDL watershed. A new WWTF must accommodate daily wastewater flow of 75–100 gallons per capita per day (gpcd) as required under Title 30, Texas Administrative Code, Chapter 217, Subchapter B, Section 217.32 (30 TAC 217.32). Conservatively using the higher daily wastewater flow capacity (100 gpcd), and multiplying it by a potential population change, would result in a conservative FG permitted flow. Based on the information in Table IV-2, the projected population change between 2020 and 2045 within the TMDL watershed is 371. Multiplying the projected population growth of TMDL watershed by the higher daily wastewater flow capacity, yields a value of 0.037 MGD for the TMDL watershed. This value would be considered the full permitted discharge of a potential future WWTF.

FG of existing or new point sources is not limited by this TMDL as long as the sources do not cause bacteria to exceed the limits. The assimilative capacity of water bodies increases as the amount of flow increases. Consequently, increases in flow allow for increased loadings. The MLDC and tables in this TMDL report will guide determination of the assimilative capacity of the water body under changing conditions, including FG.

Summary of TMDL Calculations

Table IV-6 summarizes the TMDL calculations for the TMDL watershed. The TMDL was calculated based on the median flow in the 0–20 percentile range (10% exceedance, Highest-flow regime) from the MLDC developed for TCEQ SWQM Station 16485. Allocations are based on the current geometric mean criterion for Enterococci of 35 cfu/100 mL for each component of the TMDL (with the exception of the WLA_{WWTF}, which uses 23 cfu/100 mL).

Table IV-6. TMDL allocation summary

All loads expressed as billion cfu/day Enterococci

Water Body	AU	TMDL	MOS	WLA_{WWTF}	WLA_{SW}	LA	FG
Jarbo Bayou	2425B_02	6.240	0.312	0	5.878	0.018	0.032

The final TMDL allocations (Table IV-7) needed to comply with federal requirements include the FG component within the WLA_{WWTF} (40 CFR Section 103.7).

Table IV-7. Final TMDL allocation

All loads expressed as billion cfu/day Enterococci

Water Body	AU	TMDL	MOS	WLA_{WWTF}	WLA_{SW}	LA
Jarbo Bayou	2425B_02	6.240	0.312	0.032	5.878	0.018

Seasonal Variation

Federal regulations require that TMDLs account for seasonal variation in watershed conditions and pollutant loading [40 CFR Section 130.7(c)(1)]. Analysis of the seasonal differences in indicator bacteria concentrations were assessed by comparing Enterococci concentrations obtained from eight years (2014—2022) of routine monitoring data collected in the warmer months (May through September) against those collected during the cooler months (November through March). The months of April and October were considered transitional between warm and cool seasons and were excluded from the seasonal analysis. Differences in Enterococci concentrations obtained in warmer versus cooler months were then evaluated by performing a Wilcoxon Rank Sum test (also known as the "Mann-Whitney" test). This analysis of Enterococci data indicated that there was no significant difference (α=0.05) in indicator bacteria between cool and warm weather seasons for the TMDL watershed (p=0.7106). Seasonal variation was also addressed by using all available flow and indicator bacteria records (covering all seasons) from the period of record used in MLDC development for this project.

Public Participation

TCEQ maintains an inclusive public participation process. From the inception of TMDL development, the project team sought to ensure that stakeholders were informed and involved. Communication and comments from the stakeholders in the watershed strengthen TMDL projects and their implementation.

The technical support document for this TMDL addendum (Adams and Millican, 2024) was published on the TCEQ website on March 5, 2024. Project staff presented information about this addendum at the annual spring meeting of the H-GAC Bacteria Implementation Group in Houston, TX on May 23, 2023. The public had an opportunity to comment on this addendum during the public comment period (May 10 through June 11, 2024) for the WQMP update in which this addendum is included. Notice of the public comment period for this addendum was emailed to stakeholders and posted on the TCEQ's TMDL Program News webpage.[3] Notice of the comment period, along with the document, was also posted on the WQMP Updates webpage.[4]

TCEQ accepted public comments on the original TMDL report from February 7 through March 7, 2016. No comments were submitted related to the original TMDL. A revision of the original TMDL report was completed due to a new WWTF permit in the watershed which led to substantial changes in the original TMDL calculations and a second public comment period on the original TMDL was held from July 7 through August 21, 2017. Again, no comments were submitted related to the revised original TMDL.

Implementation and Reasonable Assurance

The water body covered by this addendum is within the existing bacteria TMDL watershed for Jarbo Bayou AU 2425B_01. That TMDL watershed, including its upstream AU 2425B_02 of the same name, is within the area covered by the

[3] www.tceq.texas.gov/waterquality/tmdl/tmdlnews.html
[4] www.tceq.texas.gov/permitting/wqmp/WQmanagement_updates.html

implementation plan (I-Plan) developed by the Bacteria Implementation Group for bacteria TMDLs throughout the greater Houston area, which was approved by the Commission on January 30, 2013. The I-Plan outlines an adaptive management approach in which measures are assessed annually by the stakeholders for efficiency and effectiveness. The iterative process of evaluation and adjustment ensures continuing progress toward achieving water quality goals and expresses stakeholder commitment to the process. Please refer to the original TMDL document for additional information regarding implementation and reasonable assurance.

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