October 2021 Update to the Texas Water Quality Management Plan

Prepared by
Water Quality Division, Office of Water

Final TCEQ SFR-121/2022-01
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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY • PO BOX 13087 • AUSTIN, TX 78711-3087

Prepared by the
Office of Water
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WQMP updates are available on the TCEQ webpage:
www.tceq.texas.gov/permitting/wqmp/WQmanagement_updates.html

Developed in accordance with Sections 205(j), 208,
and 303 of the Federal Clean Water Act
and applicable regulations thereto.

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Introduction

The Texas Water Quality Management Plan (WQMP) is the product of a wastewater treatment facility (WWTF) planning process developed and updated in accordance with provisions of Sections 205(j), 208, and 303 of the federal Clean Water Act (CWA), as amended. The WQMP is an important part of the State's program for accomplishing its clean water goals.[1]

The Texas Department of Water Resources, a predecessor agency of the Texas Commission on Environmental Quality (TCEQ), prepared the initial WQMP for waste treatment management during the late 1970s. The Clean Water Act mandates that the WQMP be updated as needed to fill information gaps and revise earlier certified and approved plans. Any updates to the plan need involve only the elements of the plan that require modification. The original plan and its subsequent updates are collectively referred to as the "State of Texas Water Quality Management Plan."

The WQMP is tied to the State's water quality assessments that identify priority water quality problems. WQMPs are used to direct planning for implementation measures that control and/or prevent water quality problems. Several elements may be contained in the WQMP, such as effluent limitations of wastewater facilities, total maximum daily loads (TMDLs), nonpoint source management controls, identification of designated management agencies, and groundwater and source-water protection planning. Some of these elements may be contained in separate documents, which are prepared independently of the current WQMP update process, but may be referenced as needed to address planning for water quality control measures.

This document, as with previous updates[2], will become part of the WQMP after completion of the public comment period, certification by TCEQ, and approval by the United States Environmental Protection Agency (EPA).

The materials presented in this document revise only the information specifically addressed in the following sections. Previously certified and approved WQMPs remain in effect.

[1] See the formal definition of a water quality management plan in Title 40 Code of Federal Regulations (CFR) 130.2(k).

[2] Fiscal Years 1974, 1975, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984/85, 1986/88, 1989, 1990, 1991, 1992, 1993/94, 1995, 1996, 1997/98, 02/1999, 05/1999, 07/1999, 10/1999, 01/2000, 04/2000, 07/2000, 10/2000, 01/2001, 04/2001, 07/2001, 10/2001, 01/2002, 04/2002, 07/2002, 10/2002, 01/2003, 04/2003, 07/2003, 10/2003, 01/2004, 04/2004, 07/2004, 10/2004, 01/2005, 04/2005, 07/2005, 10/2005, 01/2006, 04/2006, 07/2006, 10/2006, 01/2007, 04/2007, 07/2007, 10/2007, 01/2008, 04/2008, 07/2008, 10/2008, 01/2009, 04/2009, 07/2009, 10/2009, 01/2010, 04/2010, 07/2010,10/2010, 01/2011, 04/2011, 07/2011, 10/2011, BPUB 2011, 01/2012, 04/2012, 07/2012,10/2012, 01/2013, 04/2013, 07/2013,10/2013, 01/2014, 04/2014, 07/2014, 10/2014, 01/2015, 04/2015, 07/2015, 10/2015, 01/2016, 04/2016, 07/2016, 10/2016, 01/2017, 04/2017, 07/2017, 10/2017, 01/2018, 04/2018, 07/2018, 10/2018, 01/2019, Terra Verde 2019, 04/2019, 07/2019, 10/2019, 01/2020, 04/2020, 07/2020, 10/2020, 01/2021, 04/2021, and 07/2021.

The final October 2021 WQMP update addresses the following topics for water quality planning purposes:

1. Projected Effluent Limits Updates
2. Service Area Population for Municipal WWTFs
3. Designation of Management Agencies for Municipal WWTFs
4. Total Maximum Daily Load (TMDL) Updates

The public comment period for the draft October WQMP update extended from November 12, 2021 through December 15, 2021.

The "Projected Effluent Limit Update" section provides information compiled from August 1, 2021 through October 31, 2021 and is based on Texas water quality standards (WQS). Projected effluent limits may be used for water quality planning purposes in Texas Pollutant Discharge Elimination System (TPDES) permit actions.

The "Service Area Population" and "Designation of Management Agencies" sections for municipal wastewater facilities were developed and evaluated by TCEQ in cooperation with the Texas Water Development Board (TWDB) and regional water quality management planning agencies.

The "Total Maximum Daily Load Update" section provides information on proposed wasteload allocations for new dischargers and revisions to existing TMDLs and was developed by the TCEQ TMDL Program in the Water Quality Planning Division.

Projected Effluent Limit Updates

Table 1 reflects proposed effluent limits for new dischargers and preliminary revisions to original proposed effluent limits for preexisting dischargers. Abbreviations used in the table heading include:

- BOD_5–5-Day Biochemical Oxygen Demand
- $CBOD_5$–5-Day Carbonaceous Biochemical Oxygen Demand
- DO–Dissolved Oxygen
- lbs/day–Pounds per Day
- MGD–Million Gallons per Day
- mg/L–Milligrams per Liter
- NH_3-N–Ammonia-Nitrogen

Effluent flows indicated in Table 1 reflect future needs and do not reflect current permits for these facilities. These revisions may be useful for water quality management planning purposes. The effluent flows and constituent limits indicated in the table have been preliminarily determined to be appropriate to satisfy the stream standards for dissolved oxygen in their respective receiving waters. These flow volumes and effluent sets may be modified at the time of permit action. These limits are based on the Texas WQS effective at the time of the production of this update. The WQS are subject to revision on a triennial basis.

Table 1. Projected Effluent Limit Updates

State Permit Number	Segment Number	EPA ID Number	Permittee Name and County	Flow (MGD)	$CBOD_5$ (mg/L)	$CBOD_5$ (lbs/day)	NH_3-N (mg/L)	NH_3-N (lbs/day)	BOD_5 (mg/L)	BOD_5 (lbs/day)	DO (mg/L)	Months/ Comments
10348-001	0838	TX0025011	Trinity River Authority of Texas Ellis	0.9	5	37.53	2	15.01			5	March-September/ Outfall 001 (Outfalls 001 and 002 total combined flow not to exceed 12 MGD)
				0.9	7	52.54	2	15.01			5	October-February/ Outfall 001 (Outfalls 001 and 002 total combined flow not to exceed 12 MGD)
				12	5	500.40	2	200.16			5	March-September/ Outfall 002 (Outfalls 001 and 002 total combined flow not to exceed 12 MGD)
				12	7	700.56	2	200.16			5	October-February/ Outfall 002 (Outfalls 001 and 002 total combined flow not to exceed 12 MGD)

State Permit Number	Segment Number	EPA ID Number	Permittee Name and County	Flow (MGD)	$CBOD_5$ (mg/L)	$CBOD_5$ (lbs/day)	NH_3-N (mg/L)	NH_3-N (lbs/day)	BOD_5 (mg/L)	BOD_5 (lbs/day)	DO (mg/L)	Months/ Comments
10361-001	0840	TX0022659	City of Pilot Point Denton	1.5	7	87.57	2	25.02			6	
10495-079	1102	TX0035009	City of Houston Harris	15.2	5	633.84	2	253.54			5	
10614-003	0504	TX0141488	City of Timpson Shelby	0.4	10	33.36	3	10.01			4	
11570-001	0823	TX0053112	City of The Colony Denton	6.3	5	262.71	1.9	99.83			6	
12370-001	1014	TX0087157	Fort Bend MUD No. 37 Fort Bend	0.35	10	29.19	2	5.84			6	
12936-001	0702	TX0095923	Undine Texas Environ-mental, LLC Galveston	0.499					10	41.62	6	
13452-001	1604	TX0103781	Sheridan Water Supply Corporation Colorado	0.076					20	12.68	2	
13817-001	2494	TX0113875	Olmito Water Supply Corporation Cameron	1.25	10	104.25	3	31.28			4	
14323-001	0823	TX0124745	Upper Trinity Regional Water District Denton	4.6	5	191.82	2	76.73			6	

State Permit Number	Segment Number	EPA ID Number	Permittee Name and County	Flow (MGD)	$CBOD_5$ (mg/L)	$CBOD_5$ (lbs/day)	NH_3-N (mg/L)	NH_3-N (lbs/day)	BOD_5 (mg/L)	BOD_5 (lbs/day)	DO (mg/L)	Months/ Comments
14372-001	0823	TX0022403	City of Sanger Denton	1.86	10	155.12	2	31.02			4	Outfall 001 (Outfalls 001 and 002 total combined flow not to exceed 1.86 MGD)
				1.86	10	155.12	2	31.02			6	Outfall 002 (Outfalls 001 and 002 total combined flow not to exceed 1.86 MGD)
14520-001	1014	TX0126675	Fort Bend MUD No. 58 Fort Bend	1.2	10	100.08	2	20.02			6	
14641-001	2432	TX0128163	Brazoria County MUD No. 40 Brazoria	1.2	10	100.08	2	20.02			5	
14757-001	1202	TX0129194	Fort Bend County MUD No. 5 Fort Bend	2.0	10	166.80	3	50.04			4	
14776-001	1008	TX0129381	TWAN Development, LLC Harris	0.029	10	2.42	3	0.73			6	
15312-001	1008	TX0135925	Harris County MUD No. 542 Harris	0.9	7	52.54	2	15.01			4	

State Permit Number	Segment Number	EPA ID Number	Permittee Name and County	Flow (MGD)	$CBOD_5$ (mg/L)	$CBOD_5$ (lbs/day)	NH_3-N (mg/L)	NH_3-N (lbs/day)	BOD_5 (mg/L)	BOD_5 (lbs/day)	DO (mg/L)	Months/ Comments
15635-001	1810	TX0138118	Plum Creek Utility Company, LLC Hays	0.75	7	43.79	2	12.51			4	
15936-001	1002	TX0140708	Basin RV LLC Harris	0.01	10	0.83	3	0.25			4	
15944-001	1103	TX0140805	Bayou Side Partners Santa Fe, Ltd Galveston	0.075	7	4.38	2	1.25			6	
15976-001	2311	TX0141160	Permian Lodging Orla, LLC Reeves	0.052455					20	8.75	4	
15978-001	1808	TX0141186	Southstar Communities, LLC Comal	0.3	10	25.02	3	7.51			4	
15980-001	0826	TX0141151	Town of Northlake Denton	0.25	10	20.85	3	6.26			4	
15981-001	1434	TX0141143	Buda 347 WWTP, LLC Travis	0.15	5	6.26	2	2.50			4	
15982-001	1015	TX0141194	Conroe Independent School District Montgomery	0.0675	10	5.63	3	1.69			4	
15985-001	1245	TX0138185	D.R. Horton, Texas, Ltd Fort Bend	0.2	10	16.68	3	5.00			4	

State Permit Number	Segment Number	EPA ID Number	Permittee Name and County	Flow (MGD)	$CBOD_5$ (mg/L)	$CBOD_5$ (lbs/day)	NH_3-N (mg/L)	NH_3-N (lbs/day)	BOD_5 (mg/L)	BOD_5 (lbs/day)	DO (mg/L)	Months/ Comments
15987-001	0831	TX0141259	City of Willow Park Parker	0.4975	5	20.75	1.8	7.47			5	Outfall 001
				0.4975	10	41.49	3	12.45			4	Outfall 002
15988-001	1202	TX0141267	Fort Bend County MUD and White & Bolin Investments, LLC Fort Bend	1.2	10	100.08	3	30.02			4	
15989-001	1012	TX0141275	Montgomery County MUD No. 172 Montgomery	0.3	5	12.51	2	5.00			4	
15990-001	1808	TX0141283	Gram Vikas Partners, Inc Comal	0.2	5	8.34	2	3.34			4	
15996-001	1302	TX0141001	Khawar & Sons, Inc Austin	0.049	10	4.09	3	1.23			4	
15997-001	1004	TX0141313	Shea Homes Houston, LLC Montgomery	0.8	10	66.72	3	20.02			6	
16000-001	1012	TX0141330	FMRWD, LLC Montgomery	0.03					10	2.50	4	
16001-001	1015	TX0141356	Magnolia Forest TX, LLC Montgomery	0.15	10	12.51	3	3.75			6	

State Permit Number	Segment Number	EPA ID Number	Permittee Name and County	Flow (MGD)	$CBOD_5$ (mg/L)	$CBOD_5$ (lbs/day)	NH_3-N (mg/L)	NH_3-N (lbs/day)	BOD_5 (mg/L)	BOD_5 (lbs/day)	DO (mg/L)	Months/ Comments
16003-001	0820	TX0141381	Restore the Grasslands, LLC Collin	0.2	10	16.68	3	5.00			4	
16004-001	1003	TX0141372	Dalasu 686 LP Liberty	0.72	10	60.05	3	18.01			4	
16005-001	1010	TX0141399	Crystal Springs Water Co., Inc Montgomery	0.75	10	62.55	3	18.77			4	
16006-001	1202	TX0141411	North Hempstead Utilities LLC Waller	0.24	10	20.02	3	6.00			4	
16007-001	1202	TX0141429	300 Acres, LLC Fort Bend	0.375	10	31.28	3	9.38			6	
16008-001	1248	TX0141437	R040062, LP Williamson	0.2	10	16.68	3	5.00			4	
16009-001	0805	TX0141445	GB878, LLC Ellis	0.5	5	20.85	2	8.34			3	
16011-001	1245	TX0141461	D.R. Horton – Texas, Ltd Fort Bend	1.5	7	87.57	2	25.02			5	
16014-001	1012	TX0141500	Deer Trail Water District, LLC Montgomery	0.18	10	15.01	2	3.00			4	

State Permit Number	Segment Number	EPA ID Number	Permittee Name and County	Flow (MGD)	$CBOD_5$ (mg/L)	$CBOD_5$ (lbs/day)	NH_3-N (mg/L)	NH_3-N (lbs/day)	BOD_5 (mg/L)	BOD_5 (lbs/day)	DO (mg/L)	Months/ Comments
16015-001	1015	TX0141518	FMRWD, LLC Montgomery	0.03	10	2.50	3	0.75			4	
16021-001	1209	TX0141551	City of Iola Grimes	0.098					20	16.35	2	

Planning Information Summary

The Water Quality Planning Division of TCEQ coordinated with TWDB and regional planning agencies to compile the wastewater facility information in this section. Domestic facility financing decisions under the State Revolving Fund (SRF) loan program must be consistent with the certified and approved WQMP.

The purpose of this section is to present data reflecting facility-planning needs, including previous water quality management plan needs requiring revision. Data are also presented to update other plan information for TWDB's SRF projects. Table 2 contains the updated service area population information. The table is organized in alphabetical order and includes the following 10 categories of information:

1. *Planning Area* – Area for which facility needs are proposed. The facility planning areas are subject to change during the facility planning process and any such changes will be documented in a later water quality management plan update. All planning areas listed are also designated management agencies (DMAs) unless otherwise noted in the "Comments" column.
2. *Service Area* – Area that receives the provided wastewater service.
3. *Needs* – A "T" indicates a need for either initial construction of a WWTF, additional treatment capacity, or the upgrading of a WWTF to meet existing or more stringent effluent requirements. A "C" indicates a need for improvements to, expansion of, rehabilitation of, or the initial construction of a wastewater collection system in the facility planning area. "T/C" indicates a need for both treatment and collection system facilities. More detailed facility planning conducted during a construction project may define additional needs and those needs will be reflected in a future update to the WQMP. A "F" indicates a need for flood mitigation.
4. *Needs Year* – The year in which the needs were identified for the planning area.

Basin Name – The river basin or designated planning entity for a designated planning area. The seven water quality management planning areas designated by the Governor are each administered by a Council of Governments (COG), a Development Council (DC), or a Planning Council (PC). Basin names are shown for areas outside one of these planning areas. The designated planning areas and their associated administering entities are:

   a. Corpus Christi – Coastal Bend COG (CBCOG)
   b. Killeen-Temple – Central Texas COG (CTCOG)
   c. Texarkana – Ark-Tex COG (ATCOG)
   d. Southeast Texas – South East Texas Regional Planning Council (SETRPC)
   e. Lower Rio Grande Valley – Lower Rio Grande Valley Development Council (LRGVDC)
   f. Dallas-Fort Worth – North Central Texas COG (NCTCOG)

g. Houston – Houston-Galveston Area Council (H-GAC)

5. *Segment* – The classified stream segment or tributary into which any recommended facility may discharge existing or projected wastewater. In the case of no-discharge facilities, this is the classified stream segment drainage area in which the facilities are located.
6. *County* – The county in which the facility planning area is located.
7. *Date* – The date the planning information was reviewed by TCEQ.
8. *Comments* – Additional explanation or other information concerning the facility planning area.
9. *Population* – The base year and projected populations for each facility planning area. Population projections presented are consistent with the latest available statewide population projections or represent the most current information obtained from facility planning analyses.

The facility information in this section is intended to be used in the preparation of facility plans and the subsequent design and construction of wastewater facilities. Design capacities of the treatment and collection systems will be based upon the population projections contained in this document, plus any additional needed capacity established for commercial/industrial flows and documented infiltration/inflow volumes (treatment or rehabilitation).

The probable needs shown under the "Needs" heading are preliminary findings; specific needs for an area must be as established in the completed and certified, detailed engineering studies conducted during facility planning under the SRF and other state loan programs.

Specific recommended effluent quality for any wastewater discharges resulting from any of the facilities in this document will be in accordance with the rule in the Texas WQS in effect at the time the permit is issued for a specific facility.

Table 2. Service Area Population Updates

Planning Agency	Service Area	Needs	Needs Year	Basin Name / COG	Segment	County	WQMP Date	Comments	Year	Population
City of Mart	City limits	T/C	2040	Brazos River Basin	1242P	McClennan	10/11/2021	WWTF and collection system improvements	2020	2370
									2025	2464
									2030	2558
									2040	2724

Designated Management Agencies

To be designated as a management agency for wastewater collection or treatment, an entity must demonstrate the legal, institutional, managerial and financial capability necessary to carry out the entity's responsibilities in accordance with Section 208(c) of the Clean Water Act (see below list of requirements). Before an entity can apply for an SRF loan, it must be recommended for designation as the management agency in the approved WQMP.

Designation as a management agency does not require the designated entity to provide wastewater services, but enables it to apply for grants and loans to provide those services. The facilities listed in Table 3 have submitted DMA resolutions to TCEQ. TCEQ submits this DMA information to EPA for approval as an update to the WQMP.

Section 208 (c) (2) Requirements for Management Agency

208(c)(2)(A): to carry out portions of an area-wide waste treatment plan.
208(c)(2)(B): to manage waste treatment works.
208(c)(2)(C): directly or by contract to design and construct new works.
208(c)(2)(D): to accept and utilize grants.
208(c)(2)(E): to raise revenues, including assessment of waste treatment charges.
208(c)(2)(F): to incur short and long term indebtedness.
208(c)(2)(G): to assure community pays proportionate cost.
208(c)(2)(H): to refuse to receive waste from non-compliant dischargers.
208(c)(2)(I): to accept for treatment industrial wastes.

Table 3. Designated Management Agencies

Planning Agency	Service Area	DMA Needs	DMA Date
City of Mart	City limits	T/C	3/16/2021

Total Maximum Daily Load Revisions

The TMDL Program works to improve water quality in impaired or threatened waters bodies in Texas. The program is authorized by and created to fulfill the requirements of Section 303(d) of the federal Clean Water Act.

The goal of a TMDL is to restore the full use of a water body that has limited quality in relation to one or more of its uses. The TMDL defines an environmental target, and based on that target, TCEQ and stakeholders develop an implementation plan with wasteload allocations for point source dischargers to mitigate human-caused sources of pollution within the watershed and restore full use of the water body.

TMDLs are developed based on intensive data collection and scientific analysis. After adoption by TCEQ, TMDLs are submitted to EPA for review and approval.

The attached appendixes may reflect proposed wasteload allocations for new dischargers and/or additions or revisions to TMDLs. Updates and addendums will be provided in the same units of measure used in the original TMDL document and will include the segment and assessment unit (AU) numbers of the affected segments. Also, note that for bacteria TMDLs, loads will typically be expressed as colony-forming units per day (cfu/day). On occasion, other expressions may be used due to different laboratory methods, such as counts or most probable number per day. For the purposes of the TMDL program, these terms are considered to be synonymous.

Appendix I. Updates to Eighteen Total Maximum Daily Loads for Bacteria in Buffalo and Whiteoak Bayous and Tributaries

Segments 1013, 1013A, 1013C, 1014, 1014A, 1014B, 1014E, 1014H, 1014K, 1014L, 1014M, 1014N, 1014O, 1017, 1017A, 1017B, 1017D, and 1017E

This appendix provides updates to TMDLs previously submitted through the state's WQMP for: Buffalo and Whiteoak Bayous and Tributaries.

The report *Eighteen Total Maximum Daily Loads for Bacteria in Buffalo and Whiteoak Bayous and Tributaries For Segment Numbers 1013, 1013A, 1013C, 1014, 1014A, 1014B, 1014E, 1014H, 1014K, 1014L, 1014M, 1014N, 1014O, 1017, 1017A, 1017B, 1017D, and 1017E* was adopted by TCEQ on 04/08/09 and approved by EPA on 06/11/09. Upon EPA approval, the TMDLs became part of the state's WQMP.

The Texas WQMP has since been updated 28 times prior to this update for this TMDL. The previous updates have revised the list of individual WLAs in the original TMDL document. Additionally, TCEQ submitted addenda to the original TMDL in the April 2013, April 2015, and January 2021 WQMP updates. These addenda added three new AUs to the original TMDL project.

The purpose of this update is to make the following changes to the TMDL:

- update the WLAs for two facilities that have increased their permitted discharges (presented in Table I-1)

The changes reflected in this update resulted in the shifting of allocations between the sum of the individual WLAs and the allowance for future growth (FG) in one AU. This was originally presented in Table 53 in the original TMDL document. The affected AU in this update is included here as Table I-2.

In Table 54 of the original TMDL, the WLAs for permitted facilities are the sum of the individual WLAs and the allowance for FG within each AU. These overall numbers did not change; Table 54 of the original TMDL remains the same.

Table I-1 - Changes to individual WLAs for the TMDL watershed

Updates Table 45, pp. 99-103 in the original TMDL document.

The WLA is expressed in billion MPN/day *E. coli*.

State Permit Number	Outfall	EPA Permit Number	AU	Permittee Name	Flow (MGD)	WLA	TMDL Comments
12370-001	001	TX0087157	1014B_01	FORT BEND COUNTY MUD NO 37	0.35	0.835	Increased discharge
14520-001	001	TX0126675	1014B_01	FORT BEND COUNTY MUD NO 58	1.2	2.862	Increased discharge

Table I-2 - TMDL summary calculations for one AU in the TMDL watershed

Updates Table 53, pp. 116-117 in the original TMDL document.

All loads expressed as billion MPN/day *E. coli*.

AU	Segment Name	TMDL	WLA WWTF	WLA SW	LA	MOS	Upstream Load	FG
1014B_01	Buffalo Bayou	626.91	100.01	482.44	38.60	0	0	5.86

Appendix II. Updates to Eight Total Maximum Daily Loads for Indicator Bacteria in Dickinson Bayou and Three Tidal Tributaries

Segments 1103, 1103A, 1103B and 1104

This appendix provides updates to TMDLs previously submitted through the state's WQMP for: Dickinson Bayou and Tributaries.

The report *Eight Total Maximum Daily Loads for Indicator Bacteria in Dickinson Bayou and Three Tidal Tributaries For Segments 1103, 1103A, 1103B and 1104* was adopted by TCEQ on 02/08/12 and approved by EPA on 06/06/12. Upon EPA approval, the TMDLs became part of the state's WQMP.

The Texas WQMP has since been updated one time prior to this update for this TMDL. The previous update has revised the list of individual WLAs in the original TMDL document. Additionally, TCEQ submitted an addendum to the original TMDL in the July 2016 WQMP update. This addendum added three new AUs to the original TMDL project.

The purpose of this update is to make the following changes to the TMDL (presented in Table II-1):

- add one new permit, and
- remove one expired permit.

The changes reflected in this update resulted in the shifting of allocations between the sum of the individual WLAs and the allowance for FG in two AUs. The original TMDL had no allotment for FG for AU 1103_04. However, ample loading is available in the WLA_{SW} and LA terms. Loading was taken from each of those terms (in a way that maintains the proportions for them as updated in the April 2016 WQMP update) and allotted as future growth for the AU. These result in no changes to the overall TMDL allocation. This was originally presented in Table 20 in the original TMDL document. The affected AUs in this update are included here as Table II-2.

Table II-1 - Changes to individual WLAs for the TMDL watershed

Updates Table 18, p. 39 in the original TMDL document.

The WLA is expressed in MPN/day Enterococci.

State Permit Number	Outfall	EPA Permit Number	AU	Permittee Name	Flow (MGD)	Indicator Bacteria	WLA	TMDL Comments
15944-001	001	TX0140805	1103_04	BAYOU SIDE PARTNERS SANTA FE, LTD.	0.075	Enterococci	4.97E+07	New permit
14440-001	001	TX0125873	1104_02	BRAZORIA COUNTY MUD NO. 24	NA	NA	NA	Permit expired

Table II-2 - TMDL summary calculations for one AU in the TMDL watershed

Updates Table 20, p. 44 in the original TMDL document.

All loads expressed as MPN/day.

AU	Indicator Bacteria	Segment Name	TMDL	WLA $_{WWTF}$	WLA $_{SW}$	LA	MOS	FG
1103_04	Enterococci	Dickinnson Bayou Tidal	6.74E+10	4.97E+07	2.69E+10	3.71E+10	3.37E+09	0.00E+00
1104_02	*E. coli*	Dickinson Bayou Above Tidal	1.04E+10	1.75E+08	1.50E+09	3.87E+09	4.11E+08	4.44E+09

Appendix III. Updates to Seven TMDLs for Indicator Bacteria in Lake Houston, East Fork San Jacinto River, West Fork San Jacinto River, and Crystal Creek Watersheds

Segments 1002, 1003, 1004, and 1004D

This appendix provides updates to TMDLs previously submitted through the state's WQMP for: Lake Houston, East Fork San Jacinto River, West Fork San Jacinto River, and Crystal Creek Watersheds.

The report *Seven Total Maximum Daily Loads for Indicator Bacteria in Lake Houston, East Fork San Jacinto River, West Fork San Jacinto River, and Crystal Creek Watersheds For Segments 1002, 1003, 1004, and 1004D* was adopted by TCEQ on 08/24/16 and approved by EPA on 10/07/16. Upon EPA approval, the TMDLs became part of the state's WQMP.

The Texas WQMP has since been updated nine times prior to this update for this TMDL. The previous updates have revised the list of individual WLAs in the original TMDL document. Additionally, TCEQ submitted an addendum to the original TMDL in the October 2018 WQMP update. This addendum added one new AU to the original TMDL project.

The purpose of this update is to make the following changes to the TMDL:

- add six new permits (presented in Table III-1)

The changes reflected in this update resulted in the shifting of allocations between the sum of the individual WLAs and the allowance for FG in six AUs. This was originally presented in Table 17 in the original TMDL document. The six affected AUs in this update are included here as Table III-2.

In Table 18 of the original TMDL, the WLAs for permitted facilities are the sum of the individual WLAs and the allowance for FG within each AU. These overall numbers did not change; Table 18 of the original TMDL remains the same.

Table III-1 - Changes to individual WLAs for the TMDL watersheds

Updates Table 13, pp. 54-55 in the original TMDL document.

The WLA is expressed in billion MPN/day *E. coli*.

State Permit Number	Outfall	EPA Permit Number	AU	Permittee Name	Flow (MGD)	WLA	TMDL Comments
15936-001	001	TX0140708	1002_06	BASIN RV LLC	0.01	0.0238	New permit
16004-001	001	TX0141372	1003_02	DALASU 686 LP	0.72	1.7171	New permit
15997-001	001	TX0141313	1004D_01	SHEA HOMES HOUSTON, LLC	0.8	1.9078	New permit
15982-001	001	TX0141194	1015_01[a]	CONROE INDEPENDENT SCHOOL DISTRICT	0.0675	0.1610	New permit
16001-001	001	TX0141356	1015_01[a]	MAGNOLIA FOREST TX, LLC	0.15	0.3577	New permit
16015-001	001	TX0141518	1015_01[a]	FMRWD, LLC	0.03	0.0715	New permit

[a] Lake Creek (1015_01) is not impaired, but is a tributary to impaired West Fork San Jacinto River AU 1004_02.

Table III-2 - TMDL summary calculations for six AUs in the TMDL watersheds

Updates Table 17, p. 59 in the original TMDL document.

All loads expressed as billion MPN/day *E. coli*.

AU	Segment Name	TMDL	MOS	WLA WWTF	WLA SW	LA AU	LA TRIB	LA RES	LA TOTAL	FG
1002_06	Lake Houston	6,197	106.57	104.88	288.17	1,535.70	3,106.90	958.70	5,601.30	96.08
1003_01	East Fork San Jacinto River	866.4	43.32	10.96	1.75	809.81	0	0	809.81	0.56
1003_02	East Fork San Jacinto River	722.8	36.14	3.95	1.19	681.11	0	0	681.11	0.41
1004_01	West Fork San Jacinto River	2,779	88.77	101.64	196.81	1,294.21	44.86	958.70	2,297.77	94.01
1004_02	West Fork San Jacinto River	1,141	9.12	46.77	4.04	75.26	0	958.70	1,033.96	47.11
1004D_01	Crystal Creek	137.8	6.89	10.18	18.79	100.92	0	0	100.92	1.02

Appendix IV. Updates to Fifteen TMDLs for Indicator Bacteria in Watersheds Upstream of Lake Houston

Segments 1004E, 1008, 1008H, 1009, 1009C, 1009D, 1009E, 1010, and 1011

This appendix provides updates to TMDLs previously submitted through the state's WQMP for: Watersheds Upstream of Lake Houston.

The report *Fifteen Total Maximum Daily Loads for Indicator Bacteria in Watersheds Upstream of Lake Houston For Segment Numbers 1004E, 1008, 1008H, 1009, 1009C, 1009D, 1009E, 1010, and 1011* was adopted by TCEQ on 04/06/11 and approved by EPA on 06/29/11. Upon EPA approval, the TMDLs became part of the state's WQMP.

The Texas WQMP has since been updated 35 times prior to this update for this TMDL. The previous updates have revised the list of individual WLAs in the original TMDL document. Additionally, TCEQ submitted three addenda to the original TMDL in the October 2013, October 2019, and October 2020 WQMP updates. These addenda added nine new AUs to the original TMDL project.

The purpose of this update is to make the following changes to the TMDL (presented in Table IV-1):

- add two new permits,
- update the WLAs for two facilities that have increased their permitted discharges,
- update the name of one permittee, and
- remove one withdrawn permit.

The changes reflected in this update resulted in the shifting of allocations between the sum of the individual WLAs and the allowance for FG in six AUs. This was originally presented in Table 18 in the original TMDL document. The six affected AUs in this update are included here as Table IV-2.

In Table 19 of the original TMDL, the WLAs for permitted facilities are the sum of the individual WLAs and the allowance for FG within each AU. These overall numbers did not change; Table 19 of the original TMDL remains the same.

Table IV-1 - Changes to individual WLAs for the TMDL watershed

Updates Table 16, pp. 49-56 in the original TMDL document.

The WLA is expressed in billion MPN/day *E. coli*.

State Permit Number	Outfall	EPA Permit Number	AU	Permittee Name	Flow (MGD)	WLA	TMDL Comments
15841-001	001	TX0139751	1008_02	SOUTH CENTRAL WATER COMPANY	NA	NA	Permit withdrawn
14776-001	001	TX0129381	1008H_01	TWAN DEVELOPMENT, LLC	0.029	0.069	Increased discharge
15312-001	001	TX0135925	1008H_01	HARRIS COUNTY MUD NO. 542	0.9	2.146	Increased discharge and updated name
15984-001	001	TX0141224	1010_02	TEXAS CAMPGROUND CLUB INC	0.04	0.095	New permit
16005-001	001	TX0141399	1010_03	CRYSTAL SPRINGS WATER CO., INC.	0.75	1.789	New permit

Table IV-2 - TMDL summary calculations for six AUs in the TMDL watershed

Updates Table 18, p. 62 in the original TMDL document.

All loads expressed as billion MPN/day *E. coli*.

AU	Sampling Locaion	Segment Name	TMDL	WLA WWTF	WLA SW	LA	MOS	FG
1008_02	11314	Spring Creek	287	10.93	70.58	190.82	14.4	0.27
1008_03	11313	Spring Creek	1420	108.43	322	869	70.9	49.67
1008_04	11312	Spring Creek	1510	144.10	334	902	75.7	54.20
1008H_01	11185	Willow Creek	166	18.80	51.1	67.8	8.28	20.02
1010_02	14241	Caney Creek	245	1.50	30	200.8	12.3	0.40
1010_04	11334	Caney Creek	493	21.23	57.4	383.8	24.7	5.87

In addition, Table IV-3 below provides an update to Table 8 found in the October 2020 addendum to this TMDL project (*Addendum Three to Fifteen Total Maximum Daily Loads for Indicator Bacteria in Watersheds Upstream of Lake Houston: One Total Maximum Daily Load for Indicator Bacteria in Walnut Creek For AU 1008I_01*). The withdrawn permit discussed earlier in this update also affects one AU in this addendum.

Table IV-4 below provides updates to Table 9 found in the October 2020 addendum to this TMDL project. The addendum added one AU that was not included in the original TMDL. This AU (1008I_01) was included as an upstream loading to 1008_02 in the

original TMDL. The withdrawn permit (15841-001/ TX0139751) affects the loading of 1008I_01 as well as the original TMDL AU 1008_02.

In Table 10 of the October 2020 TMDL addendum, the WLAs for permitted facilities are the sum of the individual WLAs and the allowance for future growth within the single AU. Therefore, these overall numbers did not change, and Table 10 of the TMDL addendum remains the same.

Table IV-3 - Changes to individual WLAs in the Walnut Creek watershed

Updates Table 8, p. 18 in the TMDL addendum document.

The WLA is expressed in billion cfu/day *E. coli*.

State Permit Number	Outfall	EPA Permit Number	AU	Permittee Name	Flow (MGD)	WLA	TMDL Comments
15841-001	001	TX0139751	1008I_01	SOUTH CENTRAL WATER COMPANY	NA	NA	Permit withdrawn

Table IV-4 - TMDL summary calculations for one AU in the Walnut Creek watershed

Updates Table 9, p. 19 in the TMDL addendum document.

All loads expressed as billion cfu/day *E. coli*.

Water Body	AU	TMDL	WLA WWTF	WLA SW	LA	FG	MOS
Walnut Creek	1008I_01	335.982	8.049	40.845	254.706	15.583	16.799

Appendix V. Updates to One Total Maximum Daily Load for Bacteria in Upper Oyster Creek

Segment 1245

This appendix provides updates to TMDLs previously submitted through the state's WQMP for: Upper Oyster Creek.

The report *One Total Maximum Daily Load for Bacteria in Upper Oyster Creek for Segment Number 1245* was adopted by TCEQ on 08/08/07 and approved by EPA on 09/28/07. Upon EPA approval, the TMDLs became part of the state's WQMP.

The Texas WQMP has since been updated 16 times prior to this update for this TMDL. The previous updates have revised the list of individual WLAs in the original TMDL document.

The purpose of this update is to make the following changes to the TMDL:

- add two new permits (presented in Table V-1)

Note that this TMDL was written for *E. coli* and that it used the single sample criterion of 394 cfu/100 mL. All of the permitted facilities covered by the original TMDL and subsequent WQMP updates have also been given a daily average for *E. coli* of 126 cfu/100 mL consistent with standard bacteria permitting practices for the state of Texas. In addition, watershed stakeholders are meeting annually to discuss water quality in Upper Oyster Creek related to this TMDL project (both instream data as well as self-reported data from permitted facilities) and may recommend stricter permit limits for *E. coli* in the future if deemed necessary.

The changes reflected in this update resulted in the shifting of allocations between WLA Continuous, WLA Non-continuous, and LA Other terms in Allocation Reach 2. This was originally presented in Table 11 in the original TMDL document, and the new allocations are updated here in Table V-2. This shifting of allocations is done in such a way that the WLA Non-continuous and LA Other terms maintain the proportions presented in the April 2016 WQMP update.

Table V-1 - Changes to individual WLAs for the Upper Oyster Creek watershed

Updates pp. 33-37 in the original TMDL document.

The WLA is expressed in cfu/day *E. coli*.

State Permit Number	Outfall	EPA Permit Number	Allocation Reach	Permittee Name	Flow (MGD)	WLA	TMDL Comments
15985-001	001	TX0138185	2	D.R. HORTON - TEXAS, LTD.	0.20	2.98×10^9	New permit
16011-001	001	TX0141461	2	D.R. HORTON - TEXAS, LTD.	1.5	2.24×10^{10}	New permit

Table V-2 - TMDL summary calculations for allocation reach in the Upper Oyster Creek watershed

Updates Table 11, p. 37 in the original TMDL document.

All loads expressed as billion cfu/day *E. coli*.

Allocation Reach	TMDL	WLA Continuous	WLA Non-continuous	LA Other	MOS
2	1,682	221.53	683.94	776.53	Implicit

Appendix VI. Updates to Two Total Maximum Daily Loads for Dissolved Oxygen in Upper Oyster Creek

Segment 1245

This appendix provides updates to TMDLs previously submitted through the state's WQMP for: Upper Oyster Creek.

The report *Two Total Maximum Daily Loads for Dissolved Oxygen in Upper Oyster Creek: Segment 1245* was adopted by TCEQ on 07/28/10 and approved by EPA on 09/21/10. Upon EPA approval, the TMDLs became part of the state's WQMP.

The Texas WQMP has since been updated 11 times prior to this update for this TMDL. The previous updates have revised the list of individual WLAs in the original TMDL document.

The purpose of this update is to make the following changes to the TMDL:

- add two new permits (presented in Table VI-1)

The allocations presented in this update were verified as satisfactory using the QUAL2K model used in establishing the original TMDL. The relevant permit limits for the facilities are provided in Table VI -2. The TMDL summary equations must also be updated for carbonaceous biochemical oxygen demand ($CBOD_5$; Table VI -3) and ammonia nitrogen (NH_3-N; Table VI -4) to reflect these changes.

Table VI-1 - Changes to individual WLAs for the Upper Oyster Creek watershed

Updates Table 9, p. 29 in the original TMDL document.

Permittee Name	TCEQ Permit No. EPA Permit No. Outfall No.	AU	Final Permitted Discharge (MGD)	Allowable $CBOD_5$ Loading (kg/d) | (lb/d)	Allowable NH_3-N Loading (kg/d) | (lb/d)	TMDL Comments
D.R. Horton - Texas, Ltd.	15985-001 / TX0138185 / 001	03	0.20	7.57 |16.69	2.27 | 5.01	New permit
D.R. Horton - Texas, Ltd.	16011-001 / TX0141461 / 001	03	1.5	39.74 |87.63	11.36 | 25.04	New permit

Table VI-2 - Permitted loadings for individual WWTFs

Corresponds to Table 3, p. 13 in the original TMDL document.

Facility Name	TCEQ Permit No. EPA Permit No. Outfall No.	Final Permitted Discharge (MGD)	$CBOD_5$ (mg/L)	NH_3-N (mg/L)	Dissolved Oxygen (mg/L)
D.R. Horton, Texas, Ltd.	15985-001 / TX0138185 / 001	0.20	10.0	3.0	4.0
D.R. Horton - Texas, Ltd.	16011-001 / TX0141461 / 001	1.5	7.0	2.0	5.0

Table VI-3 - Summary of TMDLs for Upper Reach $CBOD_5$

Updates Table 13, p. 36 in the original TMDL document.

Source Category	Proposed (Full Permitted) Loading[1] (kg/d)	Allowable Loading[2] (kg/d)
1245_03:		
WLA	377.59	377.59
LA	96	96
Total Loading	**473.59**	**473.59**

Table VI-4 - Summary of TMDLs for Upper Reach NH_3-N

Updates Table 14, p. 37 in the original TMDL document.

Source Category	Proposed (Full Permitted) Loading[1] (kg/d)	Allowable Loading[2] (kg/d)
1245_03:		
WLA	101.34	101.34
LA	3.69	3.69
Total Loading	**105.03**	**105.03**

1 Those facilities routing wastewater through polishing ponds are included in the total, assuming quality exiting the pond(s) is 1.3 mg/L $CBOD_5$ and 0.05 mg/L NH_3-N.

2 Allowable loading is determined using the QUAL2K model developed for the TMDL and existing/proposed discharges at limits necessary to meet the relevant dissolved oxygen criteria.

Note: As stated earlier, the allocations presented in this update were verified as satisfactory using the QUAL2K model used in establishing the original TMDL. The original water quality sampling for the project was completed in 2005, and since then conditions in the watershed have changed and there had been limited sampling to assess water quality. A new sampling project for Segment 1245 began in December 2015 and

continued approximately monthly through August 2017. In addition to providing valuable information to concerned stakeholders in the watershed, these data are now being analyzed and a new modeling effort is underway.