Amendment # _2_ to the Houston-Galveston Area Council (H-GAC) Multi-Basin Clean Rivers Program FY 2022/2023 QAPP

Prepared by the Houston-Galveston Area (H-GAC) in Cooperation with the Texas Commission on Environmental Quality (TCEQ)

Effective: Immediately upon approval by all parties

Questions concerning this QAPP should be directed to:
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Justification

This document details the changes made to the Multi-Basin Quality Assurance Project Plan to update Appendix B for fiscal year 2023. This document also updates personnel changes and an updated field sheet since the last amendment.

Detail of Changes

Section/Figure/Table	Page	Change	Justification
Section A1	2	Replace Dana Squires, Lead CRP QAS, with Jason Natho, *Acting* Lead CRP QAS	Personnel change at TCEQ.
Sections A3 & A4	13,14	Replace Dana Squires, Lead CRP QAS, with Jason Natho, *Acting* Lead CRP QAS	Personnel change at TCEQ.
Section A4	19	Replace Randy Acreman with Joe Willard as SJRA Data Manager.	Personnel change at SJRA.
Section A4 Figure A4.1	21	Replace Dana Squires, Lead CRP QAS, with Jason Natho, *Acting* Lead CRP QAS	Personnel change at TCEQ.
Section A4 Figure A4.1c	24	Replace Roger Sealy as the Acting Chemistry Supervisor with Huan Nguyen. Remove 'Acting' from position title.	Personnel change at HHD Lab.
Section A4 Figures A4.1e	26	Replace Randy Acreman with Joe Willard as the new Data Manager in the SJRA Organization Chart.	Personnel change at SJRA.
Section A6 24-Hour Dissolved Oxygen (DO) monitoring	31-32	Add wording to first paragraph for clarification; update list of 24-Hr DO monitoring sites; and add wording to last paragraph for clarification.	Clarified number of sites for 24-Hr DO monitoring. Some sites are changing in FY23.
Appendix A	APP A 1, 15-18	Updated A7.4 table for DWO to include "Turbidity, Observed".	The DWO field sheet already included "Turbidity, Observed" but the parameter was omitted from the A7.4 table in the QAPP. The parameter was added to the A7.4 table to correct this omission.
Appendix B	APP B 1-7	Updated sample design rationale for FY2023	Describes changes to monitoring design for FY2023 based on the FY2022 Coordinated Monitoring Meetings

Section/Figure/Table	Page	Change	Justification
Appendix B	APP B 8-34	Updated Table B1.1	Describes changes to monitoring design for FY2023 based on the FY2022 Coordinated Monitoring Meetings
Appendix C	APP 70-73	Updated map of monitoring stations	Describes changes to monitoring design for FY2023 based on the FY2022 Coordinated Monitoring Meetings
Appendix D	APP 86	Replace TRIES Amendment1 field with an updated TRIES field sheet.	Staff realized the updated field form was not provided to H-GAC during the writing of the original FY22-23 Multi-Basin QAPP

Distribution

QAPP Amendments and Revisions to Appendices will be distributed to all personnel on the distribution list maintained by H-GAC.

These changes will be incorporated into the QAPP document and TCEQ and the H-GAC will acknowledge and accept these changes by signing this amendment.

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Electronically Approved 8/24/2022

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Acting Work Leader
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Electronically Approved 8/24/2022

Jenna Wadman Date
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Electronically Approved 8/22/2022

Shane Simpson Date
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Electronically Approved 8/22/2022

Dr. George Guillen Date
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Jenny Oakley Date
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The H-GAC will provide copies of this project plan and any amendments or appendices of this plan to each person on this list and to each sub-tier project participant, e.g., subcontractors, subparticipants, or other units of government. The H-GAC will document distribution of the plan and any amendments and appendices, maintain this documentation as part of the project's quality assurance records, and ensure the documentation is available for review. Sub-Tier participants & Laboratories to receive copies of the QAPP include:

- Harris County Pollution Control Services & Laboratory
- City of Houston, Houston Health Department & Laboratory
- City of Houston, Drinking Water Operations & Laboratory
- Environmental Institute of Houston, University of Houston-Clear Lake
- San Jacinto River Authority
- Texas Research Institute for Environmental Studies & Laboratory
- Eastex Environmental Laboratory

A4 Project/Task Organization

Description of Responsibilities

TCEQ

Kyle Girten
Acting CRP Work Leader

Responsible for Texas Commission on Environmental Quality (TCEQ) activities supporting the development and implementation of the Texas Clean Rivers Program (CRP). Responsible for verifying that the TCEQ Quality Management Plan (QMP) is followed by CRP staff. Supervises TCEQ CRP staff. Reviews and responds to any deficiencies, corrective actions, or findings related to the area of responsibility. Oversees the development of Quality Assurance (QA) guidance for the CRP. Reviews and approves all QA audits, corrective actions, reports, work plans, contracts, QAPPs, and TCEQ Quality Management Plan. Enforces corrective action, as required, where QA protocols are not met. Ensures CRP personnel are fully trained.

~~Dana Squires~~ Jason Natho
Acting CRP Lead Quality Assurance Specialist

Participates in the development, approval, implementation, and maintenance of written QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Assists program and project manager in developing and implementing quality system. Serves on planning team for CRP special projects. Prepares and distributes annual audit plans. Conducts monitoring systems audits of Planning Agencies. Concurs with and monitors implementation of corrective actions. Conveys QA problems to appropriate management. Recommends that work be stopped in order to safeguard programmatic objectives, worker safety, public health, or environmental protection. Ensures maintenance of audit records for the CRP.

Jenna Wadman
CRP Project Manager

Responsible for the development, implementation, and maintenance of CRP contracts. Tracks, reviews, and approves deliverables. Participates in the development, approval, implementation, and maintenance of written QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Coordinates the review and approval of CRP QAPPs. Ensures maintenance of QAPPs. Assists CRP Lead QA Specialist in conducting Basin Planning Agency audits. Verifies QAPPs are being followed by contractors and that projects are producing data of known quality. Coordinates project planning with the Basin Planning Agency Project Manager. Reviews and approves data and reports produced by contractors. Notifies QA Specialists of circumstances which may adversely affect the quality of data derived from the collection and analysis of samples. Develops, enforces, and monitors corrective action measures to ensure contractors meet deadlines and scheduled commitments.

Cathy Anderson
Team Leader, Data Management and Analysis (DM&A) Team

Participates in the development, approval, implementation, and maintenance of written QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP). Ensures DM&A staff perform data management-related tasks.

Scott Delgado
CRP Data Manager, DM&A Team

Responsible for coordination and tracking of CRP data sets from initial submittal through CRP Project Manager review and approval. Ensures that data are reported following instructions in the Data Management Reference Guide, July 2019 or most current version (DMRG). Runs automated data validation checks in the Surface Water Quality Management Information System (SWQMIS) and coordinates data verification and error correction with CRP Project Managers. Generates SWQMIS summary reports to assist CRP Project Managers' data review. Identifies data anomalies and inconsistencies. Provides training and guidance to CRP and Planning Agencies on technical data issues to ensure that data are submitted according to documented procedures. Reviews QAPPs for valid stream monitoring stations. Checks validity of parameter codes, submitting entity code(s), collecting entity code(s), and monitoring type code(s). Develops and maintains data management-related SOPs for CRP data management. Coordinates and processes data correction requests. Participates in the development, implementation, and maintenance of written QA standards (e.g., Program Guidance, SOPs, QAPPs, QMP).

San Jacinto River Authority (SJRA)

Shane Simpson
CRP Project Manager / CRP Field Supervisor / CRP Quality Assurance Officer
Responsible for conducting routine monitoring in support of this QAPP. Responsible for implementing and monitoring CRP requirements in QAPPs, and QAPP amendments and appendices. Coordinates basin planning activities with the H-GAC. Ensures H-GAC CRP project manager and/or QAO are notified of deficiencies and corrective actions, and that issues are resolved. Responsible for supervising the collection, preservation, handling and delivery of samples. Responsible for ensuring that field measurements, sample custody, and documentation follow procedures described in this QAPP. Notifies the H-GAC QAO of particular circumstances which may adversely affect the quality of data. Trains all field monitoring personnel and maintains training records. Responsible for coordinating the implementation of the QA program. Responsible for identifying, receiving, and maintaining project QA records. Responsible for coordinating with the H-GAC QA staff to resolve QA-related issues. Coordinates and monitors deficiencies and corrective actions. Responsible for data entry of all field data.

~~*Randy Acreman*~~ *Joe Willard*
CRP Data Manager
Responsible for verifying and validating data files against measurement performance specifications and other requirements in this QAPP. Formats and delivers data in the format described in the DMRG, most recent version, to H-GAC CRP Data Manager. Submits electronic data and supporting documents (field data sheets, chain-of-custody reports, and Data Review Checklists) to the H-GAC CRP Data Manager.

Environmental Institute of Houston (EIH) University of Houston Clear Lake

Dr. George Guillen
EIH CRP Project Manager
Responsible for conducting routine monitoring in support of this QAPP. Responsible for implementing and monitoring CRP requirements in, QAPPs, and QAPP amendments and appendices. Coordinates basin planning activities with the H-GAC.

Jenny Oakley
CRP QAO / Data Manager / Field Supervisor
Responsible for verifying and validating data files against measurement performance specifications and other requirements in this QAPP. Formats and delivers data in the format described in the DMRG, most recent version, to H-GAC CRP Data Manager. Trains all field monitoring personnel and maintains training records. Ensures H-GAC CRP project manager and/or QAO are notified of deficiencies and corrective actions, and that issues are resolved. Responsible for coordinating the implementation of the QA program. Responsible for identifying, receiving, and maintaining project QA records. Responsible for coordinating with the H-GAC QA staff to resolve QA-related issues. Coordinates and monitors deficiencies and corrective actions.

Project Organization Charts

Figure A4.1. Organization Chart - Lines of Communication

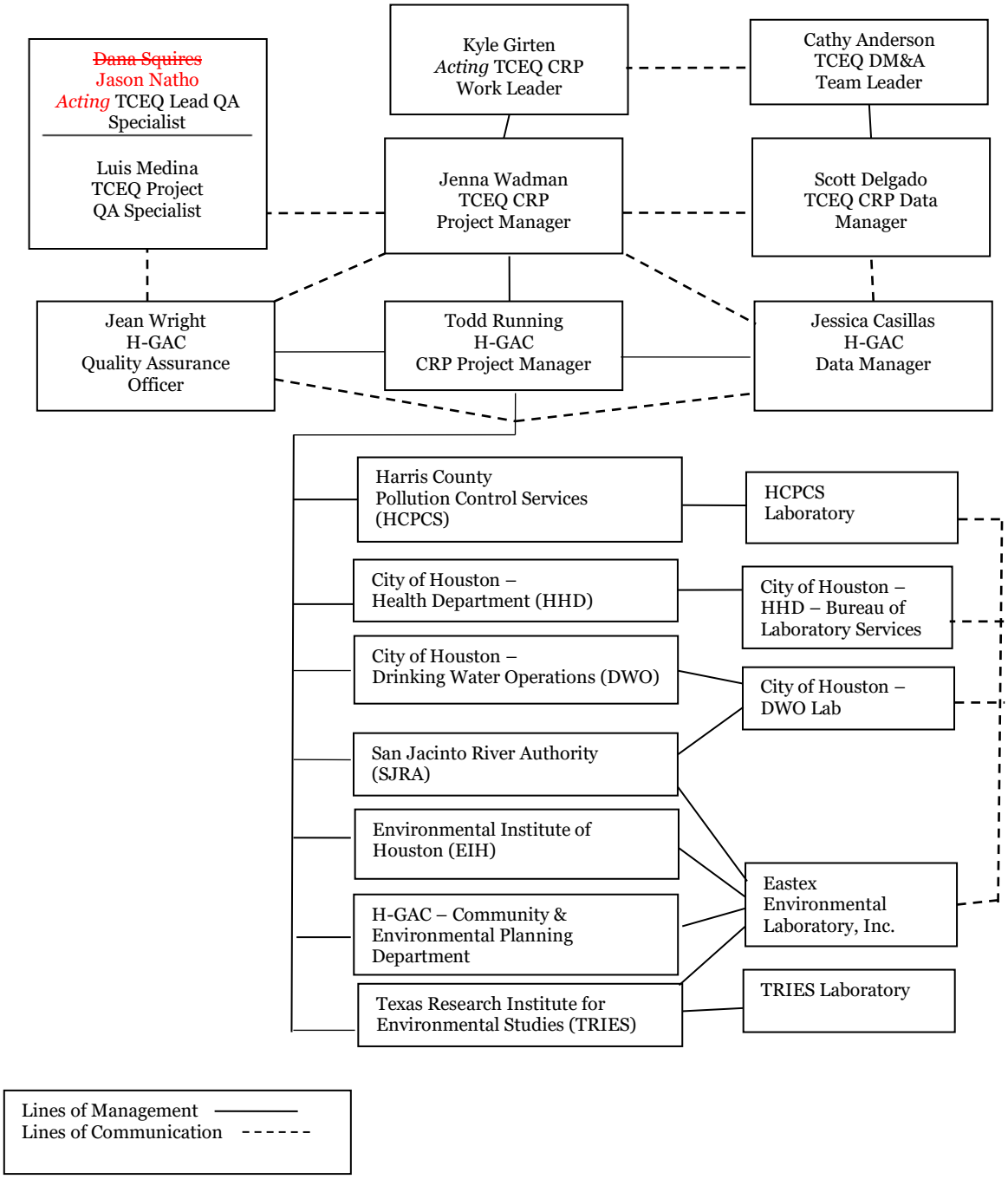


Figure A4.1c. The City of Houston, Health Department (HHD) CRP Organizational Chart.

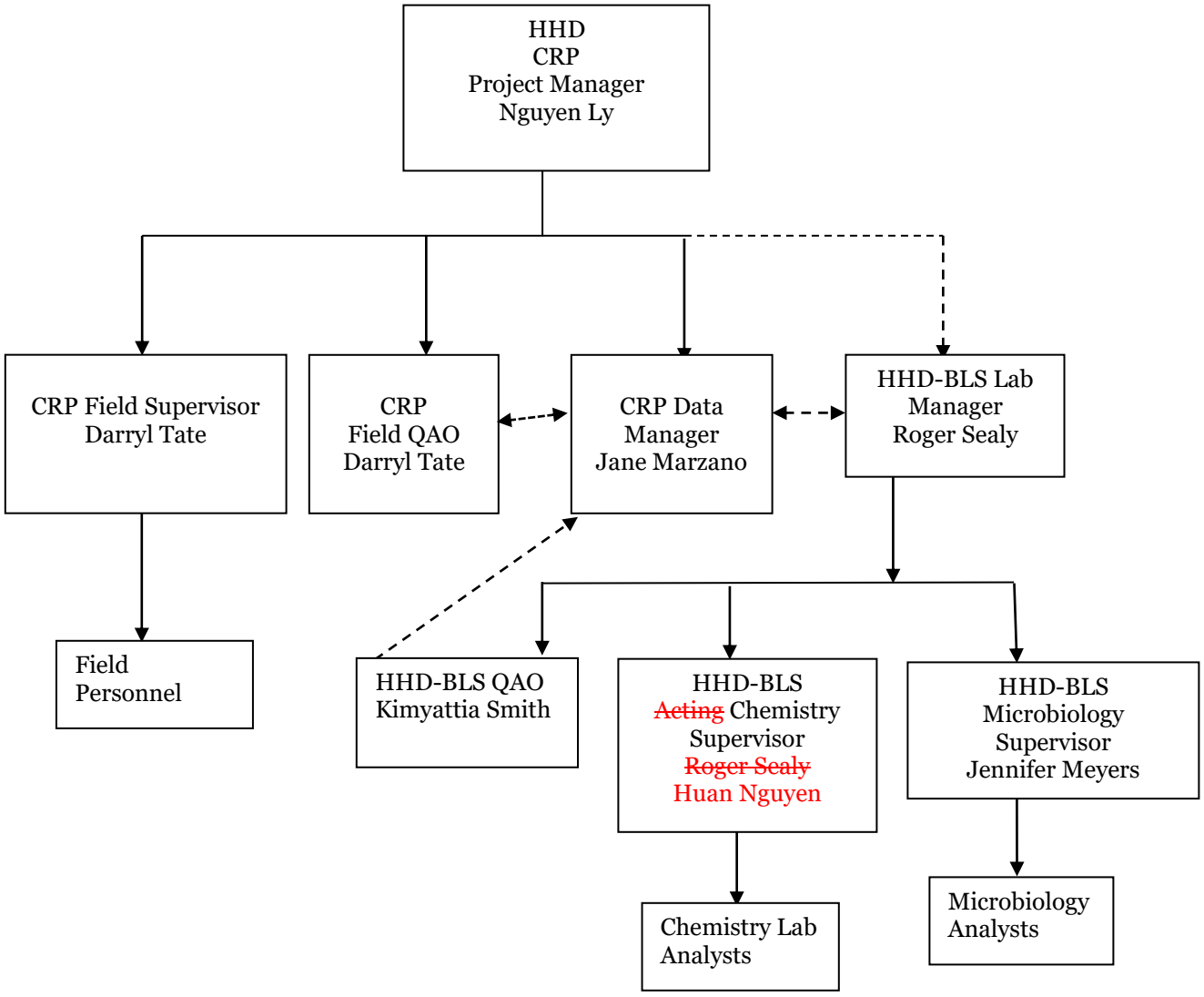
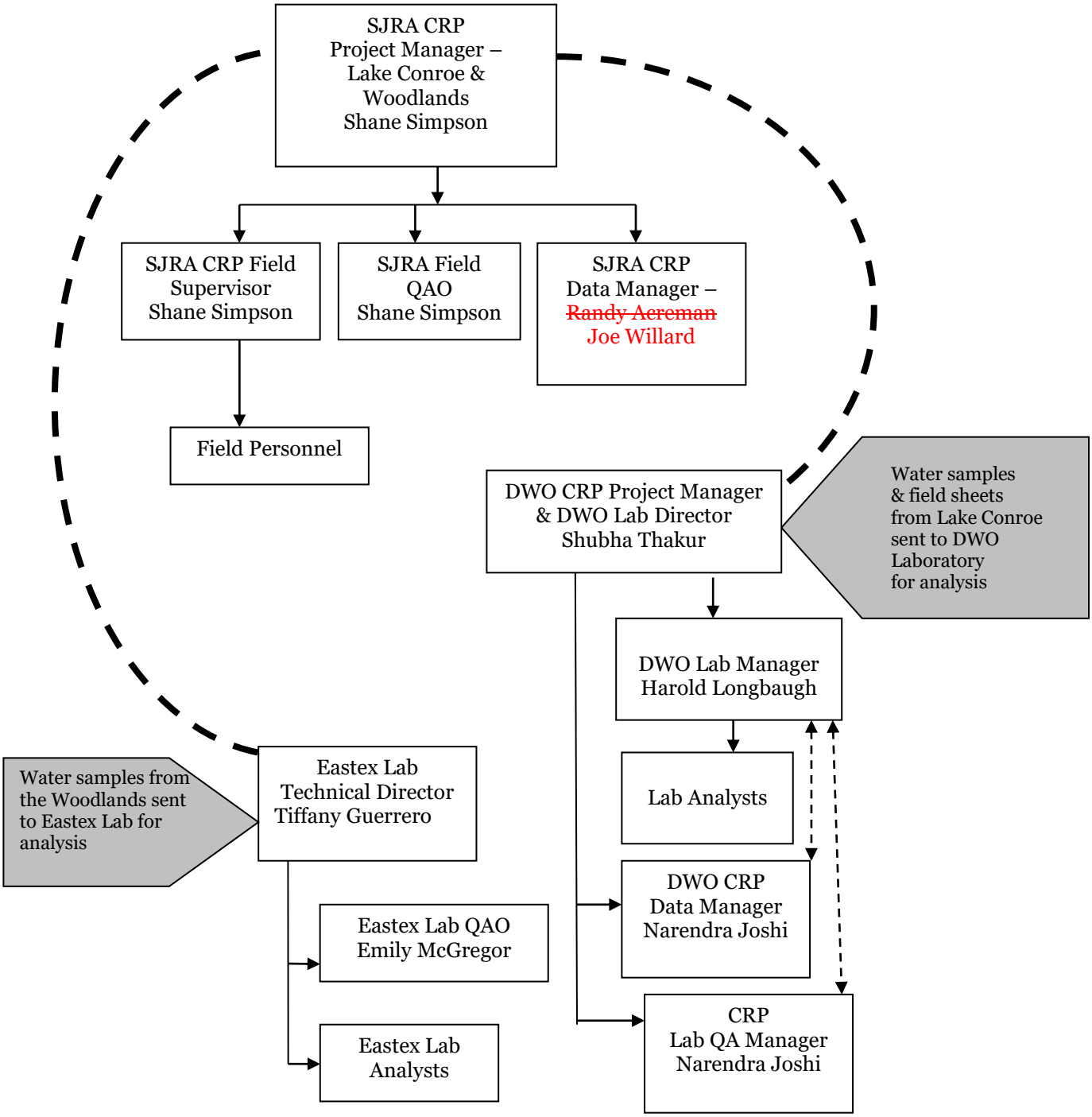


Figure A4.1e. San Jacinto River Authority (SJRA) CRP Organizational Chart.



quarterly basis directly from DWO Lab. SJRA also collects routine samples to establish baseline surface water quality information for Lake Woodlands, Panther Branch and Bear Branch – tributaries of Spring Creek. That data is also shared with the Clean Rivers Program as detailed in this QAPP. Field parameters, including flow from one USGS flow gage, are monitored monthly while conventional and bacteriological parameters are analyzed quarterly. Data is submitted to H-GAC on a quarterly basis.

Environmental Institute of Houston is contracted by H-GAC to monitor surface water quality locations in the San Jacinto-Brazos Coastal Basin, the Brazos-Colorado Coastal Basin, Trinity-San Jacinto Coastal Basin, and the Bays and Estuaries (Basin 24). Generally, data is collected for the Clean Rivers Program on a quarterly basis for a total of four events at each site per year. However, certain stations are sampled monthly due requests from a local partner or due to TCEQ Permitting Section requests.

The **Texas Research Institute for Environmental Studies** is contracted by H-GAC to monitor ambient surface water quality on the Upper East Fork San Jacinto River and Winters Bayou watersheds. Field parameters, conventional and bacteria samples are collected at every site every quarter. Flow data is collected at every site as long as the stream is wadeable.

Routine monitoring is scheduled at varying frequencies, which are determined by the parameters of concern for individual streams. Water bodies are also selected for baseline monitoring if there is high public interest; if it has a high potential for impairment; or there is a need for continuous up-to-date water quality information. Frequencies vary from quarterly for some partners and parameters to monthly in more highly impacted areas (see coordinated monitoring schedule in Appendix B).

Data collected through routine monitoring is designed to characterize water quality trends and monitor progress in protecting and restoring water quality. This monitoring will provide an overall view of water quality throughout the river and coastal basins. Baseline monitoring will include the collection of basic field parameters at all sites and the collection of bacteria, flow, and conventional chemical parameters at sites where indicated. All monitoring procedures and methods will follow the guidelines prescribed in H-GAC QAPP and the most current versions of TCEQ's *Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).*

24-Hour Dissolved Oxygen (DO) monitoring by the Houston-Galveston Area Council and the Environmental Institute of Houston.

Numerous segments and unclassified waterbodies in H-GAC region have dissolved oxygen (DO) impairments or concerns for depressed DO. Using the most recent Texas Integrated Report, H-GAC identified segments and/or unclassified waterbodies which have been listed in the 303(d) List as being impaired or having DO concerns. Additional data is needed to confirm DO impairments on these segments and/or unclassified waterbodies. All data collected and summarized will be submitted to the TCEQ. H-GAC and/or EIH will conduct 24-hour DO monitoring at seven monitoring sites quarterly during the first year of the two-year contract and up to ten monitoring sites during the second year of the two-year contract period. Monitoring events will be planned and conducted according to the most current version of TCEQ's *Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).*

The sites are located on segments/unclassified segments:

- Site 11405 – (1113A) – Armand Bayou at Fairmont Parkway along median at midpoint between bridges
- Site 16675 – (1013C) – Unnamed Trib of Buffalo Bayou at Glenwood Cemetery Rd 160 M W of intersection of Lubbock St and Sawyer St. in central Houston
- Site 11490 – (1110_01) – Oyster Creek at Hwy 35 west of Angleton in Brazoria County
- ~~Site 11493 – (1110_03) – Oyster Creek at FM 1462 west of Rosharon in Brazoria County~~
- Site 21079 – (0901A) – Cary Bayou immediately upstream of Raccoon Drive bridge in Baytown
- Site 22232 – (0801E) – Cotton Bayou 10 meter upstream of westbound I-10 frontage road in Mont Belvieu
- Site 21734 – (1105E) – Brushy Bayou at FM 213 (east of Angleton in Brazoria County)
- Site 16676 – (1016D) – Unnamed trib of Greens Bayou at Smith Road, Houston
- Site 20721 – (1302B) – West Bernard Creek at Wharton CR 225 East of Hungerford
- Site 16475 – (1101D) – Robinsons Bayou at FM270 in League City

Permit Support monitoring by the Houston-Galveston Area Council (H-GAC) and the Environmental Institute of Houston (EIH).

During FY2022 and FY2023, EIH will collect field parameters (including sonde) and discharge measurements at one station (site 18636) in segment 1102G (Marys Creek). At least ten monitoring events will be conducted at the station with a goal of collecting 12 events per year.

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Appendix A: Measurement Performance Specifications (Table A7.1-8)

Contains DWO A7.4a, 4b, 4c, and 4d replacement pages 15-18 only

TABLE A7.4a Measurement Performance Specifications for Houston Drinking Water Operations (DWO)					
Field Parameters					
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**Lab**
TEMPERATURE, WATER (DEGREES CENTIGRADE)	DEG C	water	SM 2550 B and TCEQ SOP V1	00010	Field
TRANSPARENCY, SECCHI DISC (METERS)	meters	water	TCEQ SOP V1	00078	Field
SPECIFIC CONDUCTANCE,FIELD (US/CM @ 25C)	us/cm	water	EPA 120.1 and TCEQ SOP, V1	00094	Field
OXYGEN, DISSOLVED (MG/L)	mg/L	water	SM 4500-O G and TCEQ SOP V1	00300	Field
PH (STANDARD UNITS)	s.u	water	EPA 150.1 and TCEQ SOP V1	00400	Field
DAYS SINCE PRECIPITATION EVENT (DAYS)	days	other	TCEQ SOP V1	72053	Field
DEPTH OF BOTTOM OF WATER BODY AT SAMPLE SITE	meters	water	TCEQ SOP V2	82903	Field
RESERVOIR STAGE (FEET ABOVE MEAN SEA LEVEL)* **	FT ABOVE MSL	water	TWDB	00052	Field
RESERVOIR PERCENT FULL* **	% RESERVOIR CAPACITY	water	TWDB	00053	Field
RESERVOIR ACCESS NOT POSSIBLE LEVEL TOO LOW ENTER 1 IF REPORTING	NS	other	TCEQ Drought Guidance	00051	Field
MAXIMUM POOL WIDTH AT TIME OF STUDY (METERS)**	meters	other	TCEQ SOP V2	89864	Field
MAXIMUM POOL DEPTH AT TIME OF STUDY(METERS)**	meters	other	TCEQ SOP V2	89865	Field
POOL LENGTH, METERS**	meters	other	TCEQ SOP V2	89869	Field
% POOL COVERAGE IN 500 METER REACH**	%	other	TCEQ SOP V2	89870	Field
WIND INTENSITY (1=CALM,2=SLIGHT,3=MOD.,4=STRONG)	NU	other	NA	89965	Field
PRESENT WEATHER (1=CLEAR,2=PTCLDY,3=CLDY,4=RAIN,5=OTHER)	NU	other	NA	89966	Field
WATER SURFACE(1=CALM,2=RIPPLE,3=WAVE,4=WHITECAP)	NU	water	NA	89968	Field
WATER ODOR (1=SEWAGE, 2=OILY/CHEMICAL, 3=ROTTEN EGGS, 4=MUSKY, 5=FISHY, 6=NONE, 7=OTHER (WRITE IN COMMENTS))	NU	water	NA	89971	Field
WATER COLOR 1=BRWN 2=RED 3=GRN 4=BLCK 5=CLR 6=OT	NU	water	NA	89969	Field
TURBIDITY, OBSERVED (1=LOW, 2=MEDIUM, 3=HIGH)	NU	water	NA	88842	Field

* Reporting to be consistent with SWQM guidance and based on measurement capability.
** To be routinely reported when collecting data from perennial pools.
*** As published by the Texas Water Development Board on their website https://www.waterdatafortexas.org/reservoirs/statewide

References:
United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.4b Measurement Performance Specifications for Houston Drinking Water Operations (DWO)					
Flow Parameters					
Parameter	**Units**	**Matrix**	**Method**	**Parameter Code**	**Lab**
FLOW STREAM, INSTANTANEOUS (CUBIC FEET PER SEC)	cfs	water	TCEQ SOP V1	00061	Field
FLOW SEVERITY:1=No Flow,2=Low,3=Normal,4=Flood,5=High,6=Dry	NU	water	TCEQ SOP V1	01351	Field
FLOW MTH 1=GAGE 2=ELEC 3=MECH 4=WEIR/FLU 5=DOPPLER	NU	other	TCEQ SOP V1	89835	Field

References:

United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.4c Measurement Performance Specifications for Houston Drinking Water Operations (DWO)										
Conventional Parameters in Water										
Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Precision (RPD)	Bias %Rec. of LCS	Lab
ALKALINITY, TOTAL (MG/L AS CACO3)	mg/L	water	SM 2320B	00410	20	20	NA	20	NA	DWO
RESIDUE, TOTAL NONFILTRABLE (MG/L)	mg/L	water	SM 2540D	00530	5	4	NA	NA	NA	DWO
NITROGEN, AMMONIA, TOTAL (MG/L AS N)	mg/L	water	EPA 350.3	00610	0.1	0.1	70-130	20	80-120	DWO
NITRITE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00615	0.05	0.04	70-130	20	80-120	DWO
NITRATE NITROGEN, TOTAL (MG/L AS N)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00620	0.05	0.04	70-130	20	80-120	DWO
NITROGEN, KJELDAHL, TOTAL (MG/L AS N)	mg/L	water	EPA 351.2	00625	0.2	0.2	70-130	20	80-120	Eastex
PHOSPHORUS, TOTAL, WET METHOD (MG/L AS P)	mg/L	water	EPA 365.3	00665	0.06	0.02	70-130	20	80-120	DWO
CHLORIDE (MG/L AS CL)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00940	5	5	70-130	20	80-120	DWO
SULFATE (MG/L AS SO4)	mg/L	water	EPA 300.0 Rev. 2.1 (1993)	00945	5	5	70-130	20	80-120	DWO
CHLOROPHYLL-A UG/L SPECTROPHOTOMETRIC ACID. METH	ug/L	water	EPA 446.0	32211	3	3	NA	20	80-120	Eastex

References:

United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020
U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136
American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.
TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).
TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

TABLE A7.4d Measurement Performance Specifications for Houston Drinking Water Operations (DWO)

Bacteriological Parameters in Water

Parameter	Units	Matrix	Method	Parameter Code	TCEQ AWRL	LOQ	LOQ Check Sample %Rec	Log Difference of Duplicates	Bias %Rec. of LCS	Lab
E. COLI, COLILERT, IDEXX METHOD, MPN/100ML	MPN/100 mL	water	SM 9223-B**	31699	1	1	NA	0.50*	NA	DWO
E.COLI, COLILERT, IDEXX, HOLDING TIME	hours	water	NA	31704	NA	NA	NA	NA	NA	DWO

* This value is not expressed as a relative percent difference. It represents the maximum allowable difference between the logarithm of the result of a sample and the logarithm of the duplicate result. See Section B5.

** E.coli samples analyzed by these methods should always be processed as soon as possible and within 8 hours. When transport conditions necessitate delays in delivery longer than 6 hours, the holding time may be extended and samples must be processed as soon as possible and within 30 hours.

References:

United States Environmental Protection Agency (USEPA) Methods for Chemical Analysis of Water and Wastes, Manual #EPA-600/4-79-020

U.S. Code of Federal Regulations (CFR). Title 40: Protection of Environment, Part 136

American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017.

TCEQ SOP, V1 - TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods, 2012 (RG-415).

TCEQ SOP, V2 - TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data, 2014 (RG-416).

QAPP Amendment 2

Appendix B: Task 3 Work Plan & Sampling Process Design and Monitoring Schedule (Plan)

Appendix B Sampling Process Design and Monitoring Schedule (plan)

TASK 3: WATER QUALITY MONITORING

Objectives: Water quality monitoring will focus on the characterization of a variety of locations and conditions. This will include a combination of the following:

- planning and coordinating Multi-Basin monitoring;
- routine, regularly-scheduled monitoring to collect long-term information and support statewide assessment of water quality;
- systematic, regularly-scheduled short-term monitoring to screen water bodies for issues;
- permit support monitoring to provide information for setting permit effluent limits; and
- special study, intensive monitoring targeted to:
    - identify sources and causes of pollution;
    - assess priority water quality issues;
    - obtain background water quality information;
    - provide information for setting site-specific permit effluent limits; and
    - evaluate statewide, regional, and site-specific water quality standards.

Task Description:

The Performing Party will coordinate and develop water quality monitoring strategies through the RMW and present strategies to the CRP Steering Committee for review and concurrence.
To avoid duplication of monitoring efforts, the Performing Party will continue to coordinate monitoring efforts with other area data providers. The Performing Party also will continue to arrange regional training opportunities and workshops which support cooperative monitoring efforts (e.g., field methods, biological data collection, and habitat assessment).

The Performing Party will complete the following subtasks:

Monitoring Description **-** In FY2022, the Performing Party will collect quarterly samples at a minimum of twenty (20) water quality monitoring sites throughout the Performing Party's service area. Sampling efforts will include basic field parameters, flow, conventional chemical parameters, and bacteria. Most sites are located in the upper portions of watersheds or watersheds that fall outside the jurisdiction of local partner agencies.

In addition to the Performing Party's ambient monitoring program, six (6) local agencies are involved in this multi-basin monitoring effort. The Performing Party subcontracts with several entities to conduct monitoring and coordinates with others as in-kind contributors to conduct monitoring. The six participating agencies typically monitor a combined total of over 300 monitoring sites in the region. Each agency's monitoring activities will be coordinated through the RMW. The coordination reduces monitoring duplication and allows all local agencies to see the data collection efforts of and data availability from other local agencies. Routine monitoring is scheduled at varying frequencies, which are determined by the parameters of concern for individual streams and/or proximity to a monitoring agency's field office and lab. Frequencies vary from quarterly for some parameters to monthly in

highly impacted urban areas. Baseline monitoring will include the collection of field parameters at all sites and the collection of bacteria, flow, and conventional chemical parameters at sites where indicated. Additional details concerning the monitoring activities conducted by partner agencies are outlined in the Performing Party's Multi-Basin QAPP.

In FY2023, the Performing Party and area partners are expected to monitor at a similar level of effort as in FY2022. The actual number of sites, location, frequency, and parameters collected for FY2023 will be based on priorities identified at the CRP Steering Committee and Coordinated Monitoring meetings and included in the amended Appendix B schedule of the Performing Party's Multi-Basin QAPP.

All monitoring will be completed in accordance with the H-GAC Multi-Basin QAPP, the TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods (RG-415) and the TCEQ Surface Water Quality Monitoring Procedures, Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data (RG-416). The Performing Party will include summaries of monitoring activities in the corresponding quarterly Progress Report.

24-Hour Dissolved Oxygen Monitoring **-** There are priority sub-segments with dissolved oxygen impairments or concerns in the Performing Party's monitoring area. More data collection is needed to determine or verify the impairments. The Performing Party and/or sub- participants will conduct 24-hour dissolved oxygen monitoring at a minimum of two stations, four times per year, throughout the two-year Contract period. The sites will be determined once budget is approved and site locations are coordinated and prioritized with TCEQ. The Performing Party will also include summaries of monitoring events in the corresponding quarterly Progress Report.

Permit Support Monitoring **-** During FY2022 and/or FY2023, the Performing Party may conduct monitoring activities to support TCEQ's Water Quality Division by collecting field parameters and discharge measurements at selected waterbodies identified by TCEQ. The sites will be determined once budget is approved and site locations are coordinated and prioritized with TCEQ. The Performing Party will include summaries of any activities in the corresponding quarterly Progress Report.

RMW **-** The RMW will meet during three of four quarters to discuss monitoring needs, problems, successes, and changes. The third quarter meeting is conducted as the Coordinated Monitoring Meeting (see below). The RMW is composed of Performing Party staff and representatives from local participating agencies, currently including Harris County Pollution Control, Environmental Institute of Houston, City of Houston-Health Department, City of Houston-Drinking Water Operations, Texas Research Institute for Environmental Studies, and the San Jacinto River Authority as well as H-GAC's contract lab and TCEQ Region 12. Meeting notices will be sent to TCEQ, United States Geological Survey (USGS), Texas Parks and Wildlife, Texas Department of Health, GBEP, local universities, and other interested parties to invite input on monitoring discussions and strategies. Each agency/ organization will be asked to send representatives from their field investigation staff and laboratory staff. The RMW will discuss CRP monitoring tasks and deliverables, basin monitoring priorities, training, and upcoming projects. This workgroup is designed to function as the mechanism through which data management needs and priorities are discussed. The Performing Party will include meeting summaries in the corresponding quarterly Progress Report.

RMW meeting results will be presented to the CRP Steering Committee for review and concurrence with various basin interests. This review process will be used to assess the current monitoring plan and adjust regional monitoring strategies as needed.

Coordinated Monitoring Meeting **-** The Performing Party will hold an annual coordinated monitoring meeting as described in the FY2022-2023 CRP Guidance, in lieu of the spring RMW meeting. Qualified monitoring organizations will be invited to attend the working meeting in which monitoring needs and purposes will be discussed segment by segment and station by station. Information from participants and stakeholders will be used to select stations and parameters that will enhance overall water quality monitoring coverage, eliminate duplication of effort, and address basin priorities. A summary of the changes to the monitoring schedule will be provided to the participants within two weeks of the meeting.

Changes to the monitoring schedule will be entered into the statewide Coordinated Monitoring Schedule (http://cms.lcra.org) and communicated to meeting attendees. Changes to monitoring schedules that occur during the year will be entered into the Coordinated Monitoring Schedule and communicated to meeting attendees. All requirements related to meetings will be followed and required meetings will be conducted in-person or via TCEQ approved virtual format.

Progress Report **-** Each Progress Report will include all types of monitoring and indicate the number of sampling events and the types of monitoring conducted in the quarter.

Special Studies **-** Special studies are developed, as needed, based on local stakeholder input and the results of TCEQ or the Performing Party assessments. Status reports of each special study conducted will describe activities completed during the quarter. The status reports will be submitted along with the progress report. To help keep the public and basin stakeholders informed, the Performing Party's website will be updated in a timely manner to include key elements of special studies' reports or summaries (e.g., status reports, executive summary, maps, data analysis, final reports). Special studies will be coordinated with and approved by the TCEQ Project Manager prior to implementation.

Special studies for the FY2022-2023 Contract biennium include:

Targeted Monitoring for Bacteria Source Identification – The Performing Party has tracked bacteria levels to develop a list of the most impaired water bodies for bacterial concentrations (i.e., those streams with the highest geometric means relative to the state standards for bacteria). The Performing Party will address a minimum of eight targeted watersheds within H- GAC's CRP basins. These watersheds will be prioritized based on the BIG Implementation Plan's recommendation under the Geographic Priority Framework for Five criteria: bacteria level, accessibility, use level, implementation opportunities, and any anticipated future land use changes.

Based on the prioritization analysis, at least one sub-watershed in each of the watersheds will be monitored during dry weather conditions. Water quality monitoring will be used to further refine source identification and to aid in tracking the source(s) of the impairment to the greatest extent practicable. Once verified, the source(s) of bacteria loading will be relayed to the appropriate jurisdiction for correction. Additionally, any potential sources identified during the prioritization analysis will be directed to local jurisdictions. The Performing Party will track implementation of the corrective action and may conduct additional monitoring of the original sites to determine if the corrective action results in improved water quality.

Site Characterizations **-** Review of local monitoring data indicates there are many sites throughout the region where elevated levels of bacteria or low levels of dissolved oxygen are chronic conditions. Local entities have expressed interest in determining why these chronic conditions exist. Beginning with some of the most problematic sites, the Performing Party and other CRP partners may conduct

"site specific" characterizations at future locations if determined necessary by data analysis. Habitat information, field verification of land cover, and identification of potential sources of pollution will be determined. Additional monitoring data will be collected from these small sub-watersheds as needed to supply data to support TCEQ's assessment process. Data collected during these intensive surveys may be submitted at TCEQ's request. The Performing Party will also include summaries of any activities in the corresponding quarterly Progress Report.

A short report of approximately one to five pages in length along with photographs will be submitted following completion of each characterization assessment. The reports will be submitted to TCEQ to assist with determining the appropriate water quality strategies to be pursued. An appendix to the Multi-Basin QAPP will be developed to provide the details of these characterizations.

Deliverables and Due Dates:

September 1, 2021 through August 31, 2022

A. Conduct water quality monitoring, summarize activities, and submit with Progress Report - December 15, 2021; March 15 and June 15, 2022;
B. RMW Meeting Notice – Two weeks in advance of RMW meetings;
C. Coordinated Monitoring Meeting - between March 15 and April 30, 2022;
D. Coordinated Monitoring Meeting Summary of Changes - within 2 weeks of the meeting;
E. Email notification that Coordinated Monitoring Schedule updates are complete - May 31, 2022; and
F. Site Characterization Reports (if applicable) – coordinate due date(s) with TCEQ Project Manager.

September 1, 2022 through August 31, 2023

A. Conduct water quality monitoring, summarize activities, and submit with Progress Report - September 15 and December 15, 2022; March 15 and June 15 and August 31, 2023;
B. RMW Meeting Notice – Two weeks in advance of RMW meetings;
C. Coordinated Monitoring Meeting - between March 15 and April 30, 2023;
D. Coordinated Monitoring Meeting Summary of Changes – within 2 weeks of the meeting;
E. Email notification that Coordinated Monitoring Schedule updates are complete - May 31, 2023;
F. Special Study Status Reports (if applicable) – September 15 and December 15, 2022; March 15, June 15, and August 31, 2023;
G. Special Study Desk Review/Ground Truth Preliminary Draft Reports – March 31, 2023;
H. Special Study Desk Review/Ground Truth Preliminary Final Reports – May 31, 2023;
I. Special Study Source Identification Draft Reports – May 31, 2023;
J. Special Study Source Identification Final Reports – August 31, 2023; and
K. Site Characterization Reports (if applicable) – coordinate due date(s) with TCEQ Project Manager.

Sample Design Rationale FY 2023

The sample design is based on the legislative intent of CRP. Under the legislation, the Basin Planning Agencies have been tasked with providing data to characterize water quality conditions in support of the Texas Water Quality Integrated Report, and to identify significant long-term water quality trends. Based on Steering Committee input, achievable water quality objectives and priorities and the identification of water quality issues are used to develop work plans which are in accord with available resources. As part of the Steering Committee process, the Houston-Galveston Area Council (H-GAC) coordinates closely with the TCEQ and other participants to ensure a comprehensive water monitoring strategy within the watershed.

Houston-Galveston Area Council (H-GAC): H-GAC conducts 20 routine quarterly monitoring events with flow measurements collected at all sites, whenever possible. All current routine sites, parameters, and monitoring efforts will continue into FY23. H-GAC also conducts 24-hour DO monitoring.

- **CONTINUE** quarterly 24-hr DO monitoring with flow measurements at site 16675 (1013C_01) – Unnamed Trib of Buffalo Bayou at Glenwood Cemetery. H-GAC will not collect field parameters or samples during these events.
- **DROP** quarterly 24-hr DO monitoring with flow measurements at site 11405 (1113A_01) – Armand Bayou above tidal at Fairmont Parkway.
- **ADD** quarterly 24-hr DO monitoring from site 16676 – Unnamed Tributary to Greens Bayou at Smith Rd (1016D). H-GAC will not collect field parameters or samples during these events.
- **ADD** quarterly 24-hr DO monitoring from site 16475 – Robinson Bayou at FM270, in league City (1101D). This is a tidal site so no flow monitoring will be conducted.

Houston Health Department (HHD): Currently collect samples from 133 sites 6 times per year or approximately every other month. They intend to continue with all sites except three which need to be moved due to safety issues.

- **DROP** Site 11369 (1016) – Greens Bayou at Tidwell Rd bridge (west of John Ralston Rd) due to construction blocking/limiting access. Also, there is a WWTF (WQ 0010495148 or TX0101460) on the northwest corner of the bridge. While the downstream side of the bridge is outside of the mixing zone, and they are sampling from either the bridge or the bank downstream, HH has elected to move the monitoring site downstream in FY23. See the next bullet.
- **ADD** site 11368 (1016) – Greens Bayou at Brock Park Golf Course footbridge.
- **DROP** site 11125 (1016D) – Garners Bayou at north Sam Houston Parkway/SH Loop 8 NE of Houston due to safety concerns.
- **DROP** site 11333 (1009) – Cypress Creek at House Hahl Road near Cypress.
- **ADD** site 22393 (1009) – Cypress Creek at Fry Rd.
- **DROP** site 11347 (1013) – Buffalo Bayou Tidal at Main St. bridge (in downtown Houston)
- **ADD** site 22396 (1013) – Buffalo Bayou Tidal at Congress St. bridge (in downtown Houston)

San Jacinto River Authority (SJRA): Collects 19 sites in all – 10 sites on Lake Conroe and 9 sites in The Woodlands area. SJRA plans no changes to their monitoring sites, frequency, or parameter list. Sites where SJRA collects TKN and Chlorophyll *a* were confirmed.

Houston Drinking Water Operations (DWO): Collects samples from Lake Houston and the Lake Houston watershed. Some sites are monthly, some are every other month. DWO plans no changes to their monitoring sites, parameters, or frequencies except for site 22224 (Luce Bayou 224

meters NW of end of Cry Baby Lane in Huffman). They will increase the frequency at that site from 6 times per year to 12 times per year. Sites where DWO collects TKN and Chlorophyll *a* were confirmed.

Harris County Pollution Control Services (HCPCS): Collects samples for San Jacinto River below the Lake Houston dam, to the Houston Ship Channel, side bays along the ship channel and Clear Lake area. HCPCS plans to keep all sites, parameters, and frequencies. Sites where HCPCS currently collects TKN and Chlorophyll *a* will remain the same with TKN and Chlorophyll *a* being added to a couple of other sites.

Texas Research Institute for Environmental Studies (TRIES): Is contracted to collect 10 sites on the East Fork San Jacinto River, Winters Bayou, and a couple of other tributaries. Sites are monitored quarterly and there is no plan to change the sites, frequency, or parameters. There are no TKN nor Chlorophyll *a* samples collected at any of the 10 sites.

University of Houston-Clear Lake, Environmental Institute of Houston (EIH): is contracted to collect samples in Basin 8 (Cotton Bayou), Basin 9 (Cedar Bayou), Basin 11 (Galveston and Brazoria Counties), Basin 13 (Austin, Brazoria, Colorado, Wharton, and Matagorda Counties), and Basin 24 (Bays and Estuaries). Sites are routinely monitored on a quarterly basis except for Cotton Bayou which is sampled monthly. EIH also collects 24-hour DO and monthly flow monitoring at select locations.

- **DROP** quarterly 24-hour DO monitoring along with flow measurements (freshwater sites only) at:
    - Site 11493 (1110) – Oyster Creek at FM 1462 west of Rosharon

- **CONTINUE** quarterly 24-hour DO monitoring along with flow measurements (freshwater sites only) at:
    - Site 11490 (1110) – Oyster Creek immediately downstream of SH 35 west of Angleton
    - Site 21079 (0901A) – Cary Bayou immediately upstream of Raccoon Drive bridge in Baytown (tidal).
    - Site 22232 (0801E) – Cotton Bayou 10 meters upstream of I-10 westbound frontage road in Mont Belvieu
    - Site 21734 (1105E) – Brushy Bayou at FM 213 (in Brazoria County)

- **ADD** quarterly 24-hour DO monitoring along with flow measurements at:
    - Site 11405 (1113A) – Armand Bayou at Fairmont Parkway along median at midpoint between bridges
    - Site 20721 (1302B) – West Bernard Creek at Wharton CR 225 East of Hungerford

- **CONTINUE** monthly flow and field parameters during the 8 months that do not include quarterly routine sampling with lab samples at:
    - Site 18636 (1102G) – Unnamed trib of Marys Creek 8 meters downstream of Thalerfield Dr in Pearland.

- **CONTINUE** monthly routine monitoring with all field and lab parameters including flow, at:
    - Site 22232 (0801E) – Cotton Bayou 10 meters upstream of I-10 westbound frontage road in Mont Belvieu.

Site Selection Criteria

This data collection effort involves monitoring routine water quality using procedures that are consistent with the TCEQ SWQM program. Some general guidelines are followed when selecting sampling sites, as outlined below, and discussed thoroughly in SWQM Procedures, Volumes I and II. Overall consideration is given to accessibility and safety. All monitoring activities have been developed in coordination with the CRP Steering Committee and with the TCEQ. The site selection criteria specified are those the TCEQ would like considered to produce data which is complementary to that collected by the state and which may be used in assessments, etc.

1. Locate stream sites so that samples can be safely collected from the centroid of flow. Centroid is defined as the midpoint of that portion of stream width which contains 50 percent of the total flow. If multiple potential sites on a stream segment are appropriate for monitoring, choose one that would best represent the water body, and not a site that displays unusual conditions or contaminant source(s). Avoid backwater areas or eddies when selecting a stream site.

2. At a minimum for reservoirs, locate sites near the dam (reservoirs) and in the major arms. Larger reservoirs might also include stations in the middle and upper (riverine) areas. Select sites that best represent the water body by avoiding coves and back water areas. A single monitoring site is considered representative of 25 percent of the total reservoir acres, but not more than 5,120 acres.

3. Monitoring sites are selected to maximize stream coverage or basin coverage. Very long segments may require more stations. As a rule of thumb, stream segments between 25 and 50 miles long require two stations, and longer than 50 miles require three or more depending on the existence of areas with significantly different sources of contamination or potential water quality concerns. Major hydrological features, such as the confluence of a major tributary or an instream dam, may also limit the spatial extent of an assessment based on one station.

4. Because historical water quality data can be very useful in assessing use attainment or impairment, it may be best to use sites that are on current or past monitoring schedules.

5. All classified segments (including reservoirs) should have at least one Monitoring site that adequately characterizes the water body, and monitoring should be coordinated with the TCEQ or other qualified monitoring entities reporting routine data to TCEQ.

6. Monitoring sites may be selected to bracket sources of pollution, influence of tributaries, changes in land uses, and hydrological modifications.

7. Sites should be accessible. When possible, stream sites should have a USGS or IBWC stream flow gauge. If not, it should be possible to conduct flow measurement during routine visits.

Monitoring Sites for FY 2023

Monitoring Tables for FY 2023 are presented on the following page. These monitoring tables are modified annually.

Site Description	Station ID	Water-body ID	Basin	Region	SE	CE	MT	Field	Conv	Bacteria	Flow	24 hr DO	TKN	Chloro-phyll a	Comments
ROBINSONS BAYOU AT FM270 IN LEAGUE CITY	16475	1101D	11	12	HG	HG	BS					4			Added in FY23
UNNAMED TRIB OF BUFFALO BAYOU AT GLENWOOD CEMETARY RD 160 M W OF INTERSECT OF LUBBOCK ST AND SAWYER ST IN CENTRAL HOUSTON	16675	1013C	10	12	HG	HG	BS				4	4			Added in FY22
UNNAMED TRIB OF GREENS BAYOU AT SMITH ROAD, HOUSTON	16676	1016D	10	12	HG	HG	BS				4	4			Added in FY23
ARMAND BAYOU AT FAIRMONT PARKWAY ALONG MEDIAN AT MIDPOINT BETWEEN BRIDGES	11405	1113A	11	12	HG	UI	BS				4	4			Added in FY22; Transferred to UI in FY23
OYSTER CREEK IMMED. DOWNSTREAM OF SH 35 WEST OF ANGLETON	11490	1110	11	12	HG	UI	BS				4	4			Asked to collect one more year per TCEQ assessor
WEST BERNARD CREEK AT WHARTON CR 225 EAST OF HUNGERFORD	20721	1302B	13	12	HG	UI	BS				4	4			Added in FY23
CARY BAYOU IMMEDIATELY UPSTREAM OF RACCOON DRIVE BRIDGE IN BAYTOWN	21079	0901A	9	12	HG	UI	BS					4			Added in FY21
BRUSHY BAYOU AT FM213	21734	1105E	11	12	HG	UI	BS				4	4			Added back into CMS in FY22 per assessor request
COTTON BAYOU 10 METERS UPSTREAM OF WESTBOUND I-10 FRONTAGE ROAD IN MONT BELVIEU	22232	0801E	8	12	HG	UI	BS				4	4			Added in FY21 for City of Mont Belvieu
SAN JACINTO RIVER TIDAL IMMEDIATELY DOWNSTREAM OF IH 10 BRIDGE EAST OF CHANNELVIEW	11193	1001	10	12	HG	HC	RT	12	12	12					
SAN JACINTO RIVER TIDAL 23 METERS SOUTH AND 735 METERS EAST OF INTERSECTION OF WALLISVILLE ROAD AND 7TH STREET	11198	1001	10	12	HG	HC	RT	12	12	12					

SAN JACINTO RIVER TIDAL IMMEDIATELY DOWNSTREAM OF US 90 BRIDGE EAST OF SHELDON	11200	1001	10	12	HG	HC	RT	12	12	12			4		
SAN JACINTO RIVER TIDAL AT MAGNOLIA GARDENS 1.78 KM UPSTREAM OF US BUS 90U/ BEAUMONT HIGHWAY IN HOUSTON	11201	1001	10	12	HG	HC	RT	12	12	12					
HOUSTON SHIP CHANNEL AT BAYTOWN TUNNEL/CM 103 1.84 KM NORTH AND 1.17 KM EAST OF INTERSECTION OF SH 225 AND SH 146	11254	1005	10	12	HG	HC	RT	12	12	12					
HOUSTON SHIP CHANNEL AT SAN JACINTO PK WEST OF THE BATTLESHIP TX 317 M N AND 303 M W OF INTERSECTION OF BATTLEGROUND RD AND MARKER DR	11264	1006	10	12	HG	HC	RT	12	12	12					
HOUSTON SHIP CHANNEL AT CONFLUENCE WITH GREENS BAYOU/CM 152	11271	1006	10	12	HG	HC	RT	12	12	12					
HOUSTON SHIP CHANNEL/BUFFALO BAYOU HSC AT WASHBURN TUNNEL	11283	1007	10	12	HG	HC	RT	12	12	12					
HSC/BUFFALO BAYOU IN TURNING BASIN 2.82 K UPSTREAM OF CONFLUENCE WITH BRAYS BAYOU 433 M S AND 182 M W OF INTERSECT OF SIGNET AND DORSETT	11292	1007	10	12	HG	HC	RT	12	12	12					
CLEAR LAKE AT SH 146 DRAWBRIDGE	13332	2425	24	12	HG	HC	RT	6	6	6			4	4	
TABBS BAY MIDWAY BETWEEN GOOSE CREEK AND UPPER HOG ISLAND	13338	2426	24	12	HG	HC	RT	6	6	6			4	4	
BLACK DUCK BAY AT MID BAY 0.6 KM NE OF SH 146 BRIDGE AND 0.6 KM SE OF END OF OKLAHOMA ST IN BAYTOWN	13340	2428	24	12	HG	HC	RT	6	6	6			4	4	
BURNETT BAY AT MID BAY 1.3 KM SSW OF CONFLUENCE WITH SPRING GULLY AND 1.6 KM SE OF LYNCHBURG ROAD	13344	2430	24	12	HG	HC	RT	6	6	6			4	4	
ARMAND BAYOU TIDAL 25 M WEST OF CLEAR LAKE PARK FISHING PIER IN MUD LAKE/PASADENA LAKE IN HARRIS COUNTY	15455	1113	11	12	HG	HC	RT	6	6	6			4	4	

CLEAR CREEK TIDAL AT THE CONFLUENCE WITH CLEAR LAKE 30 M NORTH AND 266 M WEST OF DAVIS ROAD AT VEGA COURT IN LEAGUE CITY IN HARRIS COUNTY	16573	1101	11	12	HG	HC	RT	6	6	6			4	4	
HOUSTON SHIP CHANNEL AT CARGILL TERMINAL NORTH OF TIDAL ROAD	16617	1006	10	12	HG	HC	RT	12	12	12					
HOUSTON SHIP CHANNEL W OF EXXON DOCKS AND N OF ALEXANDER ISLAND 316 M S AND 1.55 KM W OF INTERSECTION OF BAYWAY DR AND BAYTOWN AVE	16618	1005	10	12	HG	HC	RT	12	12	12	-				
HOUSTON SHIP CHANNEL AT LYNCHBURG FERRY INN SOUTH OF LYNCHBURG RD 658 M N AND 802 M E OF INTERSECTION OF BATTLEGROUND RD AND TIDAL RD	16619	1005	10	12	HG	HC	RT	12	12	12					
HOUSTON SHIP CHANNEL/BUFFALO BAYOU AT MAYO SHELL RD 1.42 KM S AND 41 M W OF INTERSECTION OF MAYO SHELL RD AND CLINTON DR IN HOUSTON	16620	1007	10	12	HG	HC	RT	12	12	12					
SAN JACINTO RIVER TIDAL AT CONFLUENCE WITH HSC 226 M S AND 1.07 KM W OF INTERSECTION OF S LYNCHBURG RD AND POQUENO RD IN HOUSTON	16621	1005	10	12	HG	HC	RT	12	12	12					
SAN JACINTO RIVER TIDAL AT BANANA BEND ROAD AT END OF PAVEMENT IN HOUSTON	16622	1001	10	12	HG	HC	RT	12	12	12			4	4	
SAN JACINTO RIVER TIDAL MID STREAM AT TERMINUS OF SHADY LANE IN CHANNELVIEW 9 M S AND 648 M W OF INTERSECTION OF SHADY LN AND PARK DR	17919	1001	10	12	HG	HC	RT	12	12	12					
CRYSTAL BAY IN BAYTOWN 383 METERS WEST AND 137 METERS SOUTH OF THE INTERSECTION OF BAYSHORE DRIVE AND CROW ROAD	17921	2430A	24	12	HG	HC	RT	6	6	6					
SCOTT BAY 1.2 KM SW OF INTERSECTION OF BAYWAY DRIVE AND PARK STREET IN BAYTOWN	17922	2429	24	12	HG	HC	RT	6	6	6			4	4	

UPPER SAN JACINTO BAY UNDERNEATH ELECTRICAL TRANSMISSION LINES 2.1 KM E/NE OF INTERSECTION OF MILLER CUTOFF RD AND OLD CLARK RD	17923	2427	24	12	HG	HC	RT	6	6	6			4	4	
LOWER SAN JACINTO BAY MID CHANNEL SOUTH OF SH 146 1 KM NE OF INTERSECTION OF SH 225 AND STRANG ROAD IN LAPORTE	17924	2427	24	12	HG	HC	RT	6	6	6			4	4	
BARBOUR'S CUT NEAR NORTH BANK 0.5 KM NNW OF THE INTERSECTION OF BARBOURS CUT BLVD AND MAPLE ST	17925	2436	24	12	HG	HC	RT	6	6	6					
GOOSE CREEK NEAR SH 146 340 M SOUTH OF THE INTERSECTION OF SH 146 AND WEST MAIN IN BAYTOWN	17927	2426C	24	12	HG	HC	RT	6	6	6					
HARRIS COUNTY FLOOD CONTROL DITCH A TRIBUTARY TO TAYLOR BAYOU 385 M UPSTREAM OF CONFLUENCE WEST OF SH 146 AT PORT ROAD IN HARRIS COUNTY	20012	2425E	24	12	HG	HC	RT	6	6	6					
TAYLOR BAYOU MID CHANNEL 400 M DOWNSTREAM OF PORT ROAD BRIDGE IN HARRIS COUNTY	20013	2425A	24	12	HG	HC	RT	6	6	6					
CLEAR LAKE UNNAMED INLET 115 M SOUTHWEST OF THE INTERSECTION OF NASA ROAD 1 AND OCEANVIEW DRIVE IN SEABROOK IN HARRIS COUNTY	20014	2425	24	12	HG	HC	RT	6	6	6					
TAYLOR LAKE MID LAKE AT BLUE WINDOWS 230 M SOUTH OF LAKEWAY DRIVE AT RAY SHELL COURT/HARBOR COVE CIRCLE IN HARRIS COUNTY	20015	2425A	24	12	HG	HC	RT	6	6	6			4	4	
CARPENTERS BAYOU AT MOUTH OF BARGE CANAL 32 METERS WEST AND 666 METERS SOUTH FROM THE INTERSECTION OF DE ZAVALLA ROAD AND HARDING ROAD/HARDING STREET IN HARRIS COUNTY	20797	1006	10	12	HG	HC	RT	12	12	12					
BUFFALO BAYOU IMMEDIATELY DOWNSTREAM OF GREEN BUSH ROAD 3.1 MILES SOUTHEAST OF KATY	11145	1014B	10	12	HG	HG	RT	4	4	4	4		4		

CANEY CREEK IMMEDIATELY UPSTREAM OF FM 2090 WEST OF SPLENDORA	11335	1010	10	12	HG	HG	RT	4	4	4	4		4		
LAKE CREEK AT EGYPT COMMUNITY ROAD 8.3 MILES SOUTHWEST OF CONROE	11367	1015	10	12	HG	HG	RT	4	4	4	4		4		
EAST FORK SAN JACINTO RIVER IMMEDIATELY DOWNSTREAM OF SH 150 WEST OF COLDSPRING	17431	1003	10	10	HG	HG	RT	4	4	4	4		4		
MOUND CREEK 167 METERS DOWNSTREAM OF MULLIGAN ROAD 1.35 KM UPSTREAM OF CONFLUENCE WITH LAKE CREEK	17937	1015A	10	12	HG	HG	RT	4	4	4	4		4		
LAKE CREEK AT SH 105 1.0 KM NORTHEAST OF FM 1486 NEAR DOBBIN AND 8.0 KM WEST OF MONTGOMERY TEXAS	18192	1015	10	12	HG	HG	RT	4	4	4	4				
SPRING CREEK AT ROBERTS CEMETERY ROAD WEST-NORTHWEST OF TOMBALL	18868	1008	10	12	HG	HG	RT	4	4	4	4				
CANEY CREEK AT FIRETOWER ROAD WEST TO THE CITY OF WOODBRANCH	20452	1010	10	12	HG	HG	RT	4	4	4	4				
CANEY CREEK AT COUNTY LINE ROAD IN MONTGOMERY COUNTY EAST TO THE CITY OF WILLIS	20453	1010	10	12	HG	HG	RT	4	4	4	4				
PEACH CREEK AT COUNTY LINE ROAD-FM 3081 NORTHEAST OF CONROE IN MONTGOMERY COUNTY	20454	1011	10	12	HG	HG	RT	4	4	4	4				
LITTLE CYPRESS CREEK AT MUESCHKE ROAD 4.4 KILOMETERS NORTH OF SH 290 NORTHWEST OF CYPRESS	20456	1009E	10	12	HG	HG	RT	4	4	4	4				
CYPRESS CREEK AT KATY HOCKLEY ROAD 7 KILOMETERS SOUTH OF SH 290 WEST OF CYPRESS	20457	1009	10	12	HG	HG	RT	4	4	4	4				
WALNUT CREEK AT DECKER PRAIRIE ROSEHL ROAD NORTHWEST OF TOMBALL	20462	1008I	10	12	HG	HG	RT	4	4	4	4		4		
BRUSHY CREEK AT GLENMONT ESTATES BOULEVARD 265 METERS NORTH AND 35 METERS WEST TO THE INTERSECTION OF ARNDT LANE AND ANN CIRCLE WEST OF TOMBALL	20463	1008J	10	12	HG	HG	RT	4	4	4	4		4		

HORSEPEN CREEK AT FM 529 1.9 KILOMETERS EAST OF SH 6 NORTHWEST OF HOUSTON	20465	1014C	10	12	HG	HG	RT	4	4	4	4				
TARKINGTON BAYOU AT SH 105/SH 321 SOUTHEAST OF CLEVELAND	20466	1002A	10	12	HG	HG	RT	4	4	4	4		4		
WHITE OAK CREEK AT MEMORIAL DRIVE IN CONROE	20731	1004J	10	12	HG	HG	RT	4	4	4	4		4		
WINTERS BAYOU AT TONY TAP ROAD NEAR CLEVELAND	21417	1003A	10	10	HG	HG	RT	4	4	4	4		4		
MILL CREEK AT FM 149 NORTH OF TOMBALL	21957	1008A	10	12	HG	HG	RT	4	4	4	4		4		
SPRING BRANCH IMMEDIATELY DOWNSTREAM OF SHAKEY HOLLOW WEST OF WOODBRANCH VILLAGE IN MONTGOMERY COUNTY	21965	1010C	10	12	HG	HG	RT	4	4	4	4		4		
HALLS BAYOU AT JENSEN DRIVE IN HOUSTON	11126	1006D	10	12	HG	HH	RT	6	6	6	6		4		Flow from USGS gage 8076500
HALLS BAYOU 87 METERS UPSTREAM OF TIDWELL ROAD IN SETTEGAST	11127	1006D	10	12	HG	HH	RT	6	6	6					
HUNTING BAYOU IMMEDIATELY DOWNSTREAM OF IH 10 EAST OF HOUSTON	11128	1007R	10	12	HG	HH	RT	6	6	6					
HUNTING BAYOU AT NORTH LOOP EAST/IH 610 IN HOUSTON	11129	1007R	10	12	HG	HH	RT	6	6	6	6				Flow from USGS gage 8075770
SIMS BAYOU AT TELEPHONE ROAD/SH 35 IN HOUSTON	11132	1007D	10	12	HG	HH	RT	6	6	6	6				Flow from USGS gage 8075500
SIMS BAYOU AT CULLEN BLVD/FM 865 SOUTH OF HOUSTON	11133	1007D	10	12	HG	HH	RT	6	6	6					
SIMS BAYOU AT HIRAM CLARKE RD IN HOUSTON	11135	1007D	10	12	HG	HH	RT	6	6	6	6		4		Flow from USGS gage 8075400
BRAYS BAYOU IMMEDIATELY DOWNSTREAM OF ALMEDA ROAD SOUTHWEST OF HOUSTON	11138	1007B	10	12	HG	HH	RT	6	6	6					
BRAYS BAYOU AT SOUTH MAIN ST IN HOUSTON	11139	1007B	10	12	HG	HH	RT	6	6	6	6		4		Flow from USGS gage 8075000
BRAYS BAYOU AT SOUTH GESSNER DRIVE IN HOUSTON	11140	1007B	10	12	HG	HH	RT	6	6	6	6		4		Flow from USGS gage 8074810

LITTLE WHITE OAK BAYOU AT TRIMBLE STREET/NORTH EDGE OF HOLLYWOOD CEMETERY IN HOUSTON	11148	1013A	10	12	HG	HH	RT	6	6	6	6		4		Flow from USGS gage 8074540
VOGEL CREEK IMMEDIATELY DOWNSTREAM OF WEST LITTLE YORK ROAD	11155	1017C	10	12	HG	HH	RT	6	6	6					
ROLLING FORK CREEK IMMEDIATELY DOWNSTREAM OF LAKE LANE	11157	1017F	10	12	HG	HH	RT	6		6					
SOUTH MAYDE CREEK IMMEDIATELY DOWNSTREAM OF MEMORIAL DRIVE	11163	1014H	10	12	HG	HH	RT	6	6	6			4		
BRAYS/KEEGANS BAYOU IMMEDIATELY DOWNSTREAM OF ROARK ROAD NEAR US 59 AT BELTWAY 8 IN SOUTHWEST HOUSTON	11169	1007C	10	12	HG	HH	RT	6	6	6	6				Flow from USGS gage 8074800
LITTLE VINCE BAYOU IMMEDIATELY DOWNSTREAM OF NORTH MAIN STREET IN PASADENA TX	11172	1007	10	12	HG	HH	RT	6	6	6					
WILLOW CREEK IMMEDIATELY UPSTREAM OF GOSLING ROAD	11185	1008H	10	12	HG	HH	RT	6	6	6			4		
RUMMEL CREEK IMMEDIATELY DOWNSTREAM OF MEMORIAL DRIVE IN WEST HOUSTON	11188	1014N	10	12	HG	HH	RT	6	6	6					
GREENS BAYOU IMMEDIATELY DOWNSTREAM OF GREEN RIVER ROAD/LEY ROAD IN HOUSTON	11279	1006	10	12	HG	HH	RT	6	6	6	6		4		Flow from USGS gage 8076700
HUNTING BAYOU TIDAL AT FEDERAL ROAD BRIDGE IN HOUSTON	11298	1007	10	12	HG	HH	RT	6	6	6					
SIMS BAYOU TIDAL IMMEDIATELY DOWNSTREAM OF LAWNDALE AVENUE IN HOUSTON	11302	1007	10	12	HG	HH	RT	6	6	6					
BRAYS BAYOU TIDAL AT 75TH STREET IN HOUSTON	11306	1007	10	12	HG	HH	RT	6	6	6					
BRAYS BAYOU TIDAL AT SCOTT STREET IN HOUSTON	11309	1007	10	12	HG	HH	RT	6	6	6					
SPRING CREEK IMMEDIATELY DOWNSTREAM OF RILEY FUZZEL ROAD	11312	1008	10	12	HG	HH	RT	6	6	6	6		4		Flow from USGS gage 8068520

SPRING CREEK 1.13 KM UPSTREAM OF SH 249 NEAR DRAGONFLY RD IN SPRING CREEK PARK	11315	1008	10	12	HG	HH	RT	6	6	6			4		REPLACED site 11314 in FY2020 due to bridge construction
SPRING CREEK IMMEDIATELY UPSTREAM OF DECKER PRAIRIE ROSEHILL ROAD	11323	1008	10	12	HG	HH	RT	6	6	6					
CYPRESS CREEK AT STEUBNER-AIRLINE ROAD IN HOUSTON	11330	1009	10	12	HG	HH	RT	6	6	6	6		4		Flow from USGS gage 8068900
CYPRESS CREEK AT SH 249	11331	1009	10	12	HG	HH	RT	6	6	6					
CYPRESS CREEK IMMEDIATELY DOWNSTREAM OF GRANT ROAD NEAR CYPRESS	11332	1009	10	12	HG	HH	RT	6	6	6	6		4		Flow from USGS gage 8068800
BUFFALO BAYOU TIDAL AT MCKEE ST IN HOUSTON	11345	1013	10	12	HG	HH	RT	6	6	6					
BUFFALO BAYOU TIDAL AT SHEPHERD DRIVE IN HOUSTON	11351	1013	10	12	HG	HH	RT	6	6	6	6				Flow from USGS gage 8074000
BUFFALO BAYOU AT VOSS ROAD	11356	1014	10	12	HG	HH	RT	6	6	6					
BUFFALO BAYOU IMMEDIATELY DOWNSTREAM OF WEST BELTWAY 8 IN HOUSTON	11360	1014	10	12	HG	HH	RT	6	6	6	6				Flow from USGS gage 8073600
BUFFALO BAYOU AT WILCREST DRIVE IN HOUSTON	11361	1014	10	12	HG	HH	RT	6	6	6					
BUFFALO BAYOU IMMEDIATELY DOWNSTREAM OF DAIRY ASHFORD ROAD WEST OF HOUSTON	11362	1014	10	12	HG	HH	RT	6	6	6	6				Flow from USGS gage 8073500
BUFFALO BAYOU AT ELDRIDGE ROAD IN HOUSTON	11363	1014	10	12	HG	HH	RT	6	6	6					
BUFFALO BAYOU AT SH 6	11364	1014	10	12	HG	HH	RT	6	6	6	6		4		Flow from USGS gage 8072500
GREENS BAYOU AT BROCK PARK GOLF COURSE (DOWNSTREAM OF TIDWELL RD)	11368	1016	10	12	HG	HH	RT	6	6	6					REPLACED site 11369 in FY23
GREENS BAYOU IMMEDIATELY DOWNSTREAM OF MT HOUSTON PARKWAY	11370	1016	10	12	HG	HH	RT	6	6	6					HHD confirmed this site for FY23
GREENS BAYOU AT US 59 NORTH OF HOUSTON	11371	1016	10	12	HG	HH	RT	6	6	6			4		
GREENS BAYOU AT WEST GREENS PARKWAY	11376	1016	10	12	HG	HH	RT	6	6	6					

WHITEOAK BAYOU AT NORTH SHEPHERD STREET IN HOUSTON	11389	1017	10	12	HG	HH	RT	6	6	6					
WHITEOAK BAYOU AT NORTH HOUSTON ROSSLYN ROAD	11394	1017	10	12	HG	HH	RT	6	6	6			4		
WHITEOAK BAYOU IMMEDIATELY DOWNSTREAM OF TAHOE DRIVE	11396	1017	10	12	HG	HH	RT	6	6	6					
ARMAND BAYOU AT GENOA-RED BLUFF RD NE OF ELLINGTON AFB	11404	1113A	11	12	HG	HH	RT	6	6	6					
ARMAND BAYOU AT FAIRMONT PARKWAY ALONG MEDIAN AT MIDPOINT BETWEEN BRIDGES	11405	1113A	11	12	HG	HH	RT	6	6	6			4		
ARMAND BAYOU TIDAL AT BAY AREA BLVD NORTH OF NASA AT MIDDLE OF MEDIAN BETWEEN 2 BRIDGES EASTERN SHORE	11503	1113	11	12	HG	HH	RT	6	6	6					
GREENS BAYOU 184 METERS DOWNSTREAM OF KNOBCREST DRIVE	13778	1016	10	12	HG	HH	RT	6	6	6	6		4		Flow from USGS gage 8075900
LITTLE CYPRESS CREEK IMMEDIATELY DOWNSTREAM OF KLUGE ROAD IN HOUSTON	14159	1009E	10	12	HG	HH	RT	6	6	6			4		
WHITEOAK BAYOU IMMEDIATELY DOWNSTREAM OF WEST 43RD STREET IN NORTHWEST HOUSTON	15829	1017	10	12	HG	HH	RT	6	6	6			4		
WHITEOAK BAYOU AT WEST TIDWELL ROAD IN NORTHWEST HOUSTON	15831	1017	10	12	HG	HH	RT	6	6	6					
BUFFALO BAYOU TIDAL IMMEDIATELY UPSTREAM OF JENSEN DRIVE IN HOUSTON	15841	1007	10	12	HG	HH	RT	6	6	6					
BUFFALO BAYOU TIDAL AT SABINE STREET NORTH OF ALLEN PARKWAY IN HOUSTON	15843	1013	10	12	HG	HH	RT	6	6	6					
BUFFALO BAYOU AT CHIMNEY ROCK ROAD IN HOUSTON	15845	1014	10	12	HG	HH	RT	6	6	6					
BUFFALO BAYOU IMMEDIATELY DOWNSTREAM OF BRIAR FOREST DRIVE IN WEST HOUSTON	15846	1014	10	12	HG	HH	RT	6	6	6					
TURKEY CREEK 200 METERS UPSTREAM OF MEMORIAL DRIVE AT BRIDGE IN MEMORIAL OAKS CEMETERY	15847	1014K	10	12	HG	HH	RT	6	6	6					

BRAYS BAYOU IMMEDIATELY DOWNSTREAM OF SH 6 IN WEST HOUSTON	15848	1007B	10	12	HG	HH	RT	6	6	6			4		
BRAYS BAYOU AT DAIRY ASHFORD STREET IN WEST HOUSTON	15850	1007B	10	12	HG	HH	RT	6	6	6					
BRAYS BAYOU AT WILCREST DRIVE IN WEST HOUSTON	15851	1007B	10	12	HG	HH	RT	6	6	6					
BRAYS BAYOU IMMEDIATELY DOWNSTREAM OF BEECHNUT STREET IN WEST HOUSTON	15852	1007B	10	12	HG	HH	RT	6	6	6					
BRAYS BAYOU IMMEDIATELY DOWNSTREAM OF HILLCROFT STREET IN WEST HOUSTON	15853	1007B	10	12	HG	HH	RT	6	6	6					
BRAYS BAYOU IMMEDIATELY DOWNSTREAM OF SOUTH RICE AVENUE IN WEST HOUSTON	15854	1007B	10	12	HG	HH	RT	6	6	6					
BRAYS BAYOU IMMEDIATELY DOWNSTREAM OF STELLA LINK ROAD IN HOUSTON	15855	1007B	10	12	HG	HH	RT	6	6	6					
HALLS BAYOU AT HOMESTEAD ROAD IN NORTHEAST HOUSTON	15862	1006D	10	12	HG	HH	RT	6	6	6					
HALLS BAYOU AT HIRSCH RD IN NORTHEAST HOUSTON	15863	1006D	10	12	HG	HH	RT	6	6	6					
HALLS BAYOU AT MESA DR IN NORTHEAST HOUSTON	15864	1006D	10	12	HG	HH	RT	6	6	6					
HUNTING BAYOU AT JENSEN DRIVE IN NORTHEAST HOUSTON	15867	1007R	10	12	HG	HH	RT	6	6	6					
HUNTING BAYOU AT CAVALCADE ST IN NORTHEAST HOUSTON	15869	1007R	10	12	HG	HH	RT	6	6	6					
HUNTING BAYOU AT LOCKWOOD DRIVE IN NORTHEAST HOUSTON	15873	1007R	10	12	HG	HH	RT	6	6	6					
SIMS BAYOU IMMEDIATELY DOWNSTREAM OF ALMEDA ROAD IN SOUTH HOUSTON	15876	1007D	10	12	HG	HH	RT	6	6	6					
SIMS BAYOU AT MARTIN LUTHER KING JUNIOR BOULEVARD IN SOUTH HOUSTON	15877	1007D	10	12	HG	HH	RT	6	6	6	6		4		Flow from USGS gage 8075470
SIMS BAYOU AT SWALLOW STREET IN SOUTHEAST HOUSTON	15878	1007D	10	12	HG	HH	RT	6	6	6					
BRAYS BAYOU AT SOUTH WAYSIDE DRIVE 802 METERS UPSTREAM OF IH 45 IN SOUTHEAST HOUSTON	16479	1007	10	12	HG	HH	RT	6	6	6					

GARNERS BAYOU IMMEDIATELY UPSTREAM OF OLD HUMBLE ROAD AT CONFLUENCE WITH RIENHARDT BAYOU IN NORTHEAST HOUSTON	16589	1016A	10	12	HG	HH	RT	6	6	6					
UNNAMED TRIBUTARY OF GREENS BAYOU AT MESA DR/E. HOUSTON-DYERSDALE ROAD IN NORTHEAST HOUSTON	16590	1016B	10	12	HG	HH	RT	6	6	6					
SPRING BRANCH CREEK IMMEDIATELY UPSTREAM OF WIRT ROAD 331 METERS DOWNSTREAM OF IH 10 IN WEST HOUSTON	16592	1014O	10	12	HG	HH	RT	6	6	6					
COLE CREEK IMMEDIATELY UPSTREAM OF BOLIVIA BLVD 792 METERS UPSTREAM OF CONFLUENCE WITH WHITEOAK BAYOU IN NW HOUSTON	16593	1017B	10	12	HG	HH	RT	6	6	6					
BRICKHOUSE GULLY AT US 290 IN NORTHWEST HOUSTON 2.03 KM UPSTREAM OF CONFLUENCE WITH WHITEOAK BAYOU	16594	1017A	10	12	HG	HH	RT	6		6	6				Flow from USGS gage 8074250
UNNAMED TRIBUTARY OF WHITE OAK BAYOU AT W 14TH IN WEST HOUSTON 516 METERS UPSTREAM OF CONFLUENCE WITH WHITE OAK BAYOU	16596	1017E	10	12	HG	HH	RT	6	6	6					
NEWMAN BRANCH / NEIMANS BAYOU AT MEMORIAL DRIVE IN WEST HOUSTON	16597	1014M	10	12	HG	HH	RT	6	6	6					
LITTLE WHITE OAK BAYOU AT WHITE OAK DRIVE IN NORTH HOUSTON	16648	1013A	10	12	HG	HH	RT	6	6	6					
COUNTRY CLUB BAYOU/TRIBUTARY OF BRAYS BAYOU IMMEDIATELY UPSTREAM OF SOUTH WAYSIDE DRIVE/US90A IN CENTRAL HOUSTON	16650	1007K	10	12	HG	HH	RT	6	6	6					
COUNTRY CLUB BAYOU/TRIBUTARY OF BRAYS BAYOU AT HUGHES STREET IN CENTRAL HOUSTON	16651	1007K	10	12	HG	HH	RT	6	6	6					
WILLOW WATERHOLE AT MCDERMED DRIVE IN SOUTHWEST HOUSTON	16652	1007E	10	12	HG	HH	RT	6		6					
KUHLMAN GULLY/TRIBUTARY OF BRAYS BAYOU AT BROCK STREET 311 METERS	16653	1007G	10	12	HG	HH	RT	6	6	6					

UPSTREAM OF WHEELER STREET IN SOUTHEAST CENTRAL HOUSTON															
UNNAMED TRIBUTARY OF BRAYS BAYOU AT DUMFRIES DRIVE IN SOUTH WEST HOUSTON	16654	1007L	10	12	HG	HH	RT	6	6	6					
UNNAMED TRIBUTARY OF SIMS BAYOU AT DULCIMER STREET IN SOUTH HOUSTON	16655	1007N	10	12	HG	HH	RT	6	6	6					
SIMS BAYOU SOUTH BRANCH AT TIFFANY DRIVE IN SOUTH HOUSTON	16656	1007A	10	12	HG	HH	RT	6		6					
UNNAMED TRIBUTARY OF HUNTING BAYOU IMMEDIATELY UPSTREAM OF JOHN RALSTON ROAD IN EAST HOUSTON	16657	1007M	10	12	HG	HH	RT	6		6					
PLUM CREEK/TRIBUTARY OF SIMS BAYOU AT OLD GALVESTON ROAD IN SOUTH EAST HOUSTON	16658	1007I	10	12	HG	HH	RT	6	6	6					
PINE GULLY/TRIBUTARY OF SIMS BAYOU AT OLD GALVESTON ROAD IN SOUTH EAST HOUSTON	16659	1007H	10	12	HG	HH	RT	6	6	6					
BERRY BAYOU/TRIBUTARY OF SIMS BAYOU IMMEDIATELY UPSTREAM OF AHRENS DRIVE IN SOUTH EAST HOUSTON	16660	1007	10	12	HG	HH	RT	6	6	6					
BERRY BAYOU IMMEDIATELY UPSTREAM OF SOUTH RICHEY STREET IN SOUTH EAST HOUSTON	16661	1007F	10	12	HG	HH	RT	6	6	6					
BIG GULCH AT WALLISVILLE ROAD IN EAST HOUSTON	16662	1006F	10	12	HG	HH	RT	6		6					
SPRING GULLY AT WEST TERMINUS OF BARNESWORTH DRIVE IN NORTHEAST HOUSTON	16663	1006H	10	12	HG	HH	RT	6	6	6			4		
GOODYEAR CREEK TIDAL IMMEDIATELY UPSTREAM OF IH 10 IN EAST HOUSTON	16664	1006	10	12	HG	HH	RT	6	6	6					
UNNAMED TRIBUTARY OF HALLS BAYOU IMMEDIATELY DOWNSTREAM OF LANGLEY ROAD IN NORTH HOUSTON	16665	1006J	10	12	HG	HH	RT	6	6	6					
UNNAMED TRIBUTARY OF HALLS BAYOU AT TALTON STREET IN NORTH EAST HOUSTON	16666	1006I	10	12	HG	HH	RT	6		6					

UNNAMED TRIBUTARY OF HALLS BAYOU AT WOODLYN ROAD IN NORTH EAST HOUSTON	16667	1006I	10	12	HG	HH	RT	6		6					
UNNAMED TRIB OF BUFFALO BAYOU NEAR GLENWOOD CEMETARY ST 120 METERS SOUTH AND 110 METERS WEST OF INTERSECTION OF LUBBOCK ST AND WEST SAWYER ST IN CENTRAL HOUSTON	16675	1013C	10	12	HG	HH	RT	6	6	6					
UNNAMED TRIBUTARY OF GREENS BAYOU AT SMITH RD IN NORTHEAST HOUSTON	16676	1016D	10	12	HG	HH	RT	6	6	6					
SPRING GULLY AT SPRING CREEK OAKS DRIVE IN TOMBALL	17481	1009D	10	12	HG	HH	RT	6	6	6					
LANGHAM CREEK AT SH 6 IN NORTHWEST HOUSTON	17482	1014E	10	12	HG	HH	RT	6	6	6	6				
BEAR CREEK AT OLD GREENHOUSE ROAD WEST OF HOUSTON	17484	1014A	10	12	HG	HH	RT	6	6	6					
UNNAMED TRIBUTARY OF HORSEPEN BAYOU TIDAL AT PENN HILLS	17485	1113C	11	12	HG	HH	RT	6	6	6					
BIG ISLAND SLOUGH AT HILLRIDGE ROAD IN SOUTHEAST HOUSTON	17486	1113E	11	12	HG	HH	RT	6	6	6					
WILLOW SPRING AT BANDRIDGE ROAD IN SOUTHEAST HOUSTON	17487	1113D	11	12	HG	HH	RT	6	6	6					
SPRING CREEK IMMEDIATELY DOWNSTREAM OF KUYKENDAHL ROAD NORTHEAST OF HOUSTON	17489	1008	10	12	HG	HH	RT	6	6	6			4		
HALLS BAYOU AT AIRLINE ROAD IN NORTH HOUSTON	17490	1006D	10	12	HG	HH	RT	6	6	6					
HALLS BAYOU AT DEER TRAIL DRIVE IN NORTH HOUSTON	17491	1006D	10	12	HG	HH	RT	6	6	6	6				Flow from USGS gage 8076200
BUFFALO BAYOU AT SOUTH MASON ROAD WEST OF HOUSTON	17492	1014B	10	12	HG	HH	RT	6	6	6					
MASON CREEK 151 METERS DOWNSTREAM OF PARK PINE DRIVE WEST OF HOUSTON	17494	1014L	10	12	HG	HH	RT	6	6	6					
GREENS BAYOU IMMEDIATELY UPSTREAM OF MILLS ROAD WEST OF HOUSTON	17495	1016	10	12	HG	HH	RT	6	6	6					

FAULKEY GULLY OF CYPRESS CREEK 105 METERS DOWNSTREAM OF LAKEWOOD FOREST DRIVE NORTHWEST OF HOUSTON	17496	1009C	10	12	HG	HH	RT	6	6	6					
SIMS BAYOU UPSTREAM TIDAL AT SOUTH POST OAK ROAD IN SOUTHWEST HOUSTON	17976	1007D	10	12	HG	HH	RT	6	6	6					
UNNAMED TRIBUTARY OF BUFFALO BAYOU IMMEDIATELY DOWNSTREAM OF EMILE ST ON NORTH BANK 120 M SOUTH OF CLINTON DRIVE IN CENTRAL HOUSTON	17977	1007O	10	12	HG	HH	RT	6	6	6					
UNNAMED TRIBUTARY OF HUNTING BAYOU AT MINDEN STREET APPROXIMATELY 0.3 KM EAST OF LOCKWOOD AND S OF N 610 LOOP EAST	18689	1007V	10	12	HG	HH	RT	6		6					
BINTLIFF DITCH TRIBUTARY OF BRAYS BAYOU UNDER CENTER OF BISSONNET ST BRIDGE 317 M NE OF BISSONNET AT FONDREN RD IN SW HOUSTON	18690	1007T	10	12	HG	HH	RT	6		6					
MIMOSA DITCH TRIBUTARY OF BRAYS BAYOU AT NEWCASTLE DR IN SOUTHWEST HOUSTON	18691	1007U	10	12	HG	HH	RT	6		6					
POOR FARM DITCH TRIBUTARY OF BRAYS BAYOU AT EASTBOUND NORTH BRAESWOOD BLVD APPROX 200 M E OF BUFFALO SPEEDWAY IN SW HOUSTON	18692	1007S	10	12	HG	HH	RT	6		6					
KEEGAN'S BAYOU AT SYNOTT ROAD 1.1 KM SOUTH OF THE INTERSECTION OF SYNOTT ROAD AND BISSONET STREET IN SOUTHWEST HOUSTON	20211	1007C	10	12	HG	HH	RT	6	6	6					
BUFFALO BAYOU NORTH SHORE IMMEDIATELY UNDERNEATH THE SOUTHBOUND FEEDER ROAD BRIDGE OF IH 610 WEST IN HOUSTON	20212	1014	10	12	HG	HH	RT	6	6	6					
WILLOW CREEK AT TUWA ROAD APPROXIMATELY 859 METERS DOWNSTREAM OF FM 2920 ROAD IN NORTHERN HARRIS COUNTY	20730	1008H	10	12	HG	HH	RT	6	6	6					
SIMS BAYOU AT GALVESTON ROAD IN HOUSTON	20736	1007	10	12	HG	HH	RT	6	6	6					

GREENS BAYOU AT WALLISVILLE ROAD APPROX 150 METERS NORTHEAST OF THE INTERSECTION OF DATTNER ROAD AND WALLISVILLE ROAD IN HOUSTON	21008	1006	10	12	HG	HH	RT	6	6	6					
HARRIS COUNTY FLOOD CONTROL DISTRICT CHANNEL D138 / CHIMNEY DITCH IMMEDIATELY UPSTREAM OF CAVERSHAM DRIVE BETWEEN THE NORTHBOUND AND SOUTHBOUND SECTIONS OF CHIMNEY ROCK ROAD IN HOUSTON	21180	1007W	10	12	HG	HH	RT	6	6	6					
SOUTH MAYDE CREEK AT SOUTH PARK VIEW DRIVE WEST OF HOUSTON	21813	1014H	10	12	HG	HH	RT	6	6	6					
UNNAMED TRIBUTARY OF GREENS BAYOU AT ALDINE WESTFIELD RD	22090	1016C	10	12	HG	HH	RT	6	6	6					
UNNAMED TRIBUTARY OF WHITE OAK BAYOU 18 METERS SOUTH AND 18 METERS WEST OF HELBERG RD DEAD END	22094	1017D	10	12	HG	HH	RT	6	6	6					
TURKEY CREEK AT CLAY ROAD IN NORTHWEST HOUSTON	22169	1014K	10	12	HG	HH	RT	6	6	6			4		
CYPRESS CREEK AT FRY ROAD 3.3 KM UPSTREAM OF US 290/NORTHWEST FWY	22393	1009	10	12	HG	HH	RT	6	6	6	6		4		REPLACED site 11333 in FY23 due to safety
BUFFALO BAYOU TIDAL AT CONGRESS ST BRIDGE IN HOUSTON	22396	1013	10	12	HG	HH	RT	6	6	6	6				REPLACED site 11347 in FY23
CRYSTAL CREEK AT FM 1314	11181	1004D	10	12	HG	HW	RT	6	6	6			4		
LUCE BAYOU/SAN JACINTO RIVER EAST FORK AT HUFFMAN-NEW CANEY ROAD	11187	1002B	10	12	HG	HW	RT	6	6	6					
LAKE HOUSTON NORTH SIDE OF MISSOURI PACIFIC RAILROAD BRIDGE 137 METERS SOUTH AND 1.36 KM WEST OF INTERSECTION OF PINO LN AND SUNOCO RD	11208	1002	10	12	HG	HW	RT	12	12	12			4	4	
LAKE HOUSTON AT FM 1960 WEST END PASS BRIDGE 269 M N AND 731 M E OF INTERSECTION OF ATASCOCITA SHORES AND FM 1960/CITY HO SITE 9	11211	1002	10	12	HG	HW	RT	12	12	12					

LAKE HOUSTON AT FM 1960 EAST END PASS BRIDGE 235 M S AND 950 M WEST OF INTERSECTION OF FM 1960 AND FAIRLAKE LANE/CITY HO SITE 13	11212	1002	10	12	HG	HW	RT	12	12	12					
EAST FORK SAN JACINTO RIVER AT FM 1485	11235	1003	10	12	HG	HW	RT	6	6	6	6		4		Flow from USGS gage 8070200
EAST FORK SAN JACINTO RIVER IMMEDIATELY UPSTREAM OF TX-105 BUSINESS ROUTE / W SOUTHLINE STREET WEST OF CLEVELAND	11238	1003	10	12	HG	HW	RT	6	6	6	6		4		Flow from USGS gage 8070000
WEST FORK SAN JACINTO RIVER IMMEDIATELY UPSTREAM OF SH 242	11243	1004	10	12	HG	HW	RT	6	6	6			4		
WEST FORK SAN JACINTO RIVER IMMEDIATELY DOWNSTREAM OF SH 105 NW OF CONROE CAMS772	11251	1004	10	12	HG	HW	RT	6	6	6	6				Flow from USGS gage 8067650
SPRING CREEK BRIDGE AT IH 45 20 MILES NORTH OF HOUSTON	11313	1008	10	12	HG	HW	RT	6	6	6	6		4		Flow from USGS gage 8068500
CYPRESS CREEK BRIDGE ON IH 45 15 MI NORTH OF HOUSTON	11328	1009	10	12	HG	HW	RT	6	6	6	6		4		Flow from USGS gage 8069000
CANEY CREEK IMMEDIATELY DOWNSTREAM OF FM 1485	11334	1010	10	12	HG	HW	RT	6	6	6					
PEACH CREEK BRIDGE AT FM 2090 IN SPLENDORA	11337	1011	10	12	HG	HW	RT	6	6	6	6		4		Flow from USGS gage 08071000
LAKE HOUSTON 90 M S AND 349 M W OF INTERSECTION OF MAGNOLIA PT DR AND DIAMOND WAY CANEY CREEK ARM IN HOUSTON	16623	1002	10	12	HG	HW	RT	12	12	12					
PEACH CREEK IMMEDIATELY UPSTREAM OF OLD HWY 105	16625	1011	10	12	HG	HW	RT	6	6	6					
STEWARTS CREEK 175 METERS DOWNSTREAM OF SH LOOP 336 SOUTHEAST OF CONROE	16626	1004E	10	12	HG	HW	RT	6	6	6			4		
LK HOUSTON W OF LK SHADOWS SUBDIVISION MID LAKE NW OF HOUSTON 2.09 KM N AND 1.38 KM E OF INTERSECT OF LK HOUSTON PKWY AND DITE CAYLIN	16668	1002	10	12	HG	HW	RT	12	12	12					

LAKE HOUSTON IN THE WEST FORK SAN JACINTO RIVER CHANNEL 270 M EAST AND 60 M NORTH OF MISTY COVE AT ATASCOCITA PLACE DR	18667	1002	10	12	HG	HW	RT	12	12	12			4	4	
LAKE HOUSTON/LUCE BAYOU 123 M NORTH AND 188 M WEST OF LAKEWATER DR AT WATERWOOD DR IN WATER WONDERLAND SUBDIVISION IN HARRIS COUNTY	18670	1002	10	12	HG	HW	RT	12	12	12			4	4	
LAKE HOUSTON WEST FORK SAN JACINTO RIVER ARM UNDER POWER LINES 567 METERS EAST AND 538 METERS NORTH FROM THE INTERSECTION OF BELLEAU WOOD DRIVE AND SOUTHSHORE DRIVE IN HOUSTON	20782	1002	10	12	HG	HW	RT	12	12	12					
CANEY CREEK AT MILLMAC ROAD NORTHEAST OF CUT AND SHOOT	21465	1010	10	12	HG	HW	RT	6	6	6			4		
LUCE BAYOU 224 METERS NORTHWEST OF END OF CRY BABY LANE IN HUFFMAN	22224	1002	10	12	HG	HW	RT	12	12	12					ADDED in FY21
LAKE CONROE AT DAM MID CHANNEL 85 M OUT FROM MIDDLE TAINTER GATE 922 M N AND 426 M E OF INTERSECTION OF DAM SITE RD AND SH 105	11342	1012	10	12	HG	SJ	RT	12	12	12			4	4	
LAKE CONROE AT FM 1375 IN THE MAIN CHANNEL 4TH PILING FROM THE EAST 541 M SOUTH AND 1.40 KM W OF INTERSECTION OF KAGLE RD AND FM 1375 USGS SITE GC	11344	1012	10	12	HG	SJ	RT	12	12	12			4	4	
PANTHER BRANCH 295 METERS DOWNSTREAM OF SAWDUST ROAD IN THE WOODLANDS	16422	1008C	10	12	HG	SJ	RT	12	4	4					
LAKE WOODLANDS AT WESTERN REACH 110 METERS NORTH AND 100 METERS EAST OF INTERSECTION OF MEADOW COVE DR AND PLEASURE COVE DR IN THE WOODLANDS	16481	1008F	10	12	HG	SJ	RT	12	4	4					
LAKE WOODLANDS AT SOUTH END 23 METERS NORTH AND 50 METERS EAST OF THE WEST EDGE OF DAM IN THE WOODLANDS	16482	1008F	10	12	HG	SJ	RT	12	4	4			4	4	

LAKE WOODLANDS AT MID POINT 130 METERS NORTH AND 30 METERS EAST OF THE NORTHERN INTERSECTION OF E SHORE DR AND CAPE HARBOR PL IN THE WOODLANDS	16483	1008F	10	12	HG	SJ	RT	12	4	4					
LAKE WOODLANDS AT NORTH END 111 METERS DOWNSTREAM OF RESEARCH FOREST DRIVE IN THE WOODLANDS	16484	1008F	10	12	HG	SJ	RT	12	4	4					
LOWER PANTHER BRANCH AT FOOTBRIDGE 265 M UPSTREAM OF SAWDUST RD APPROX 200 M UPSTREAM OF PERMIT WQ0011401-001 LOCATED AT 2436 SAWDUST ROAD	16627	1008C	10	12	HG	SJ	RT	12	4	4					
UPPER PANTHER BRANCH APPROX 80 M UPSTREAM OF PERMIT WQ0012597-001 LOCATED AT 5402 RESEARCH FOREST DR	16629	1008B	10	12	HG	SJ	RT	12	4	4					
UPPER PANTHER BRANCH APPROX 170 METERS DOWNSTREAM OF PERMIT WQ0012597-001 LOCATED AT 5402 RESEARCH FOREST DR	16630	1008B	10	12	HG	SJ	RT	12	4	4					
BEAR BRANCH 20 METERS DOWNSTREAM OF RESEARCH FOREST DRIVE	16631	1008E	10	12	HG	SJ	RT	12	4	4	12				Flow from USGS gage 8068390
LAKE CONROE AT APRIL POINT MID CHANNEL 559 M N AND 586 M E OF INTERSECTION OF APRIL POINT PLACE AND APRIL HILL	16638	1012	10	12	HG	SJ	RT	12	12	12					
LAKE CONROE AT SOUTH END OF LAKE ON EAST SIDE 201 METERS SOUTH AND 732 METERS WEST OF INTERSECTION OF S VALLEY DRIVE AND CREST DRIVE	16639	1012	10	12	HG	SJ	RT	12	12	12			4	4	
LAKE CONROE S OF BENTWATER ISLAND WEST COVE S OF FM 1097 BRIDGE 769 M N AND 89 M E OF INTERSECTION OF WATERFRONT AND SPRINGTIME DR	16640	1012	10	12	HG	SJ	RT	12	12	12					
LAKE CONROE AT AQUARIUS POINT MID CHANNEL N OF FM 830 BOAT RAMP 437 M N AND 924 M W OF INTERSECT OF FM 830 AND LAKEVIEW MANOR DR	16641	1012	10	12	HG	SJ	RT	12	12	12					

LAKE CONROE AT LAKE MID POINT MID CHANNEL AT FM 1097 BRIDGE 57 M S AND 520 M W OF INTERSECTION OF FM 1097 AND BLUEBERRY HILL	16642	1012	10	12	HG	SJ	RT	12	12	12			4	4	
LAKE CONROE AT HUNTERS POINT CANEY CREEK ARM E OF SCOTTS RIDGE BOAT RAMP 640 M N AND 558 M E OF INTERSECT OF TEEL RD AND HUNTERS TRL	16643	1012	10	12	HG	SJ	RT	12	12	12					
LAKE CONROE AT PARADISE POINT MID CHANNEL 396 METERS S AND 309 M WEST INTERSECTION OF PARADISE VIEW DRIVE AND PARADISE POINT DRIVE	16644	1012	10	12	HG	SJ	RT	12	12	12					
LAKE CONROE AT MOUTH OF SANDY BRANCH COVE 2.63 KM EAST OF INTERSECTION OF HARDY SMITH ROAD AND F S 218 A	16645	1012	10	12	HG	SJ	RT	12	12	12					
EAST FORK SAN JACINTO RIVER AT FM 2090 IN LIBERTY COUNTY	11236	1003	10	12	HG	TF	RT	4	4	4	4				
EAST FORK SAN JACINTO RIVER IMMEDIATELY DOWNSTREAM OF FM 945 5.6 MILES NORTH OF CLEVELAND	11237	1003	10	10	HG	TF	RT	4	4	4	4				
EAST FORK SAN JACINTO RIVER IMMEDIATELY DOWNSTREAM OF US 59 AT RED GULLY	14242	1003	10	12	HG	TF	RT	4	4	4	4				
WINTERS BAYOU AT FM 2929 / FOUR NOTCH ROAD 4.8 KILOMETERS SOUTH OF PHELPS IN WALKER COUNTY	21933	1003A	10	12	HG	TF	RT	4	4	4	4				
BOSWELL CREEK AT FOUR NOTCH ROAD / BOSWELL ROAD 13 KILOMETERS NORTHEAST OF NEW WAVERLY IN WALKER COUNTY	21934	1003C	10	12	HG	TF	RT	4	4	4	4				
WINTERS BAYOU AT FM 2693 IN SAN JACINTO COUNTY	21935	1003A	10	10	HG	TF	RT	4	4	4	4				
WINTERS BAYOU AT SH 150 IN SAN JACINTO COUNTY	21936	1003A	10	10	HG	TF	RT	4	4	4	4				
WINTERS BAYOU AT DABNEY BOTTOM RD IN SAN JACINTO COUNTY	21937	1003A	10	10	HG	TF	RT	4	4	4	4				
NEBLETTS CREEK AT FM 1725 IN SAN JACINTO COUNTY	21938	1003B	10	10	HG	TF	RT	4	4	4	4				

EAST FORK SAN JACINTO RIVER AT NORTH BUTCH ARTHUR ROAD IN SAN JACINTO COUNTY	21939	1003	10	10	HG	TF	RT	4	4	4	4				
CEDAR BAYOU TIDAL MID CHANNEL 45 M DOWNSTREAM OF SH 146 NORTHEAST OF BAYTOWN	11115	0901	9	12	HG	UI	RT	4	4	4					
CEDAR BAYOU ABOVE TIDAL 30 M DOWNSTREAM OF FM 1942 AT EAST BANK	11118	0902	9	12	HG	UI	RT	4	4	4	4				
CEDAR BAYOU ABOVE TIDAL 45 M DOWNSTREAM OF FM 1960 NORTHEAST OF HUFFMAN	11123	0902	9	12	HG	UI	RT	4	4	4	4		4		
MOSES BAYOU AT NORTHBOUND SH 146 BRIDGE AT MID-BRIDGE NORTH OF LA MARQUE	11400	2431A	24	12	HG	UI	RT	4	4	4					
HIGHLAND BAYOU AT FAIRWOOD ROAD IN LA MARQUE IN GALVESTON COUNTY	11415	2424A	24	12	HG	UI	RT	4	4	4					
MUSTANG BAYOU AT FM 2917 SOUTH OF ALVIN	11423	2432A	24	12	HG	UI	RT	4	4	4	4		4		
CEDAR CREEK AT FM 517 W OF DICKINSON	11434	1103E	11	12	HG	UI	RT	4	4	4	4				
GUM BAYOU AT FM 517 E OF DICKINSON	11436	1103D	11	12	HG	UI	RT	4	4	4			4		
DICKINSON BAYOU TIDAL AT SH 146 BRIDGE EAST OF DICKINSON	11455	1103	11	12	HG	UI	RT	4	4	4			4		
DICKINSON BAYOU TIDAL AT IH 45	11462	1103	11	12	HG	UI	RT	4	4	4					
CHOCOLATE BAYOU TIDAL FM 2004 BRIDGE SOUTH OF ALVIN	11478	1107	11	12	HG	UI	RT	4	4	4			4	4	
OYSTER CREEK TIDAL AT THAT-WAY DRIVE 0.5 MILES BELOW FM 2004	11486	1109	11	12	HG	UI	RT	4	4	4			4		
OYSTER CREEK IMMED. DOWNSTREAM OF SH 35 WEST OF ANGLETON	11490	1110	11	12	HG	UI	RT	4	4	4	4		4		Conv & Bact added in second half of FY2020
OYSTER CREEK AT SIMS RD / BRAZORIA CR 30 WEST OF ANGLETON	11491	1110	11	12	HG	UI	RT	4	4	4	4		4		ADDED site to CRP in FY2019. TCEQ Permitting requested flow in FY20.

OYSTER CREEK AT FM 1462 WEST OF ROSHARON	11493	1110	11	12	HG	UI	RT	4	4	4	4		4		ADDED in FY20 at request of TCEQ Permitting. ADDED Conv & Bact in second half of FY20.
HARDEMAN SLOUGH IMMEDIATELY DOWNSTREAM OF ALLENHURST RD NE OF FM 2540 NEAR ALLENHURST COMMUNITY	12135	1305A	13	12	HG	UI	RT	4	4	4	4				
CANEY CREEK IMMEDIATELY UPSTREAM OF CONCRETE BRIDGE 210 M DOWNSTREAM OF LINVILLE BAYOU CONFLUENCE AND ADJACENT TO FM 521	12151	1304	13	12	HG	UI	RT	4	4	4					
CANEY CREEK AT SERGEANT JOE PARKS JR MEMORIAL HIGHWAY / FM 457 IN MATAGORDA COUNTY	12153	1305	13	12	HG	UI	RT	4	4	4	4		4		
WEST BAY OFFAT BAYOU MID BAYOU OPPOSITE LAKE MADELINE CANAL	13322	2424D	24	12	HG	UI	RT	4	4	4			4	4	
WEST BAY AT RANGE MARKER D BETWEEN SOUTH DEER ISLAND AND TEICHMAN POINT	14622	2424	24	12	HG	UI	RT	4	4	4			4	4	
OFFATTS BAYOU OFF CM 18	14645	2424D	24	12	HG	UI	RT	4	4	4					
HIGHLAND BAYOU TIDAL AT FM 519 335 METERS NORTH OF SH 6 IN CITY OF HITCHCOCK IN GALVESTON COUNTY	15941	2424A	24	12	HG	UI	RT	4	4	4			4		
SAN BERNARD RIVER IMMEDIATELY DOWNSTREAM OF FM 3013 ON THE COLORADO-AUSTIN COUNTY LINE APPROXIMATELY 15KM SW OF SEALY	16370	1302	13	12	HG	UI	RT	4	4	4	4				
GEISLER BAYOU AT FM517 BRIDGE 0.19MI UPSTREAM OF DICKINSON BAYOU IN DICKINSON	16470	1103C	11	12	HG	UI	RT	4	4	4					
BENSONS BAYOU AT FM 517 / PINE DR IN DICKINSON	16471	1103A	11	12	HG	UI	RT	4	4	4					
MARYS CREEK AT MARYS CROSSING IN NORTH FRIENDSWOOD	16473	1102B	11	12	HG	UI	RT	4	4	4	4		4		
ROBINSONS BAYOU AT FM270 IN LEAGUE CITY	16475	1101D	11	12	HG	UI	RT	4	4	4					

HIGHLAND BAYOU 80 M NORTHEAST OF SH 6 BRIDGE CENTERPOINT IN BAYOU VISTA WEST OF IH 45 IN GALVESTON COUNTY	16488	2424A	24	12	HG	UI	RT	4	4	4			4	4	
MARCHAND BAYOU TIDAL AT FM519 IN HITCHCOCK	16490	2424C	24	12	HG	UI	RT	4	4	4					
HIGHLAND BAYOU AT FM 2004 IN HITCHCOCK IN GALVESTON COUNTY	16491	2424A	24	12	HG	UI	RT	4	4	4			4		
CHIGGER CREEK AT FM528 BRIDGE IN FRIENDSWOOD	16493	1101B	11	12	HG	UI	RT	4	4	4	4				
HIGHLAND BAYOU AT END OF BAYOU LANE FREDDIESVILLE	16562	2424A	24	12	HG	UI	RT	4	4	4					
LAKE MADELINE AT CORNER OF BELUCHE DRIVE AND DOMINIQUE DRIVE IN GALVESTON	16564	2424B	24	12	HG	UI	RT	4	4	4			4	4	
CLEAR CREEK TIDAL AT BROOKDALE DR APPROX 0.1MI DOWNSTREAM OF GRISSOM RD IN COUNTRYSIDE PARK IN CANOE LAUNCHING AREA IN LEAGUE CITY	16576	1101	11	12	HG	UI	RT	4	4	4			4		
MAGNOLIA CREEK AT W BAY AREA BLVD LEAGUE CITY APPROX 250 M UPSTREAM OF WWTP PERMIT WQ0010568-003	16611	1101A	11	12	HG	UI	RT	4	4	4	4				
COWART CREEK 9 METERS UPSTREAM FROM CASTLEWOOD DRIVE BRIDGE IN FRIENDSWOOD	16677	1102A	11	12	HG	UI	RT	4	4	4	4				
HICKORY SLOUGH AT ROBINSON DRIVE IN PEARLAND	17068	1102C	11	12	HG	UI	RT	4	4	4	4				
CHOCOLATE BAY 1.2 KM EAST OF WHARTON BAYOU AND 8.1 KM DOWNSTREAM OF FM 2004	17085	2432	24	12	HG	UI	RT	4							Collect only field parameters. Only collect lab samples if another site is dry that quarter.
CHOCOLATE BAY 200 M NORTHWEST OF HORSE GROVE POINT AND 5.1 KM DOWNSTREAM OF FM 2004	17086	2432	24	12	HG	UI	RT	4	4	4			4	4	
MOSES BAYOU AT SH 3 IN TEXAS CITY	17910	2431E	24	12	HG	UI	RT	4	4	4	4				
NEW BAYOU AT FM 2004 S/SW OF HITCHCOCK	17911	2432E	24	12	HG	UI	RT	4	4	4					

PERSIMMON BAYOU AT FM 2004 S/SW OF HITCHCOCK	17913	2432D	24	12	HG	UI	RT	4	4	4					
COW BAYOU AT NASA ROAD 1 IN WEBSTER 100 M EAST OF FM 270/EL CAMINO REAL	17928	1101C	11	12	HG	UI	RT	4	4	4					
AUSTIN BAYOU AT FM 2004 APPROXIMATELY 4 MILES SOUTHEAST OF ANGLETON TEXAS IN BRAZORIA COUNTY	18048	1105B	11	12	HG	UI	RT	4	4	4			4	4	
BASTROP BAYOU OFF BAYOU WOOD DR DUE EAST OF BRAZORIA CR 201 AT BASTROP BAYOU DR APPROX 1.1 KM UPSTREAM OF SH 288B IN RICHWOOD VILLAGE	18502	1105	11	12	HG	UI	RT	4	4	4					
BASTROP BAYOU TIDAL APPROXIMATELY 15 M OFF NORTH BANK AND 1.55 KM UPSTREAM OF FM 2004 IN RICHWOOD VILLAGE	18503	1105	11	12	HG	UI	RT	4	4	4					
BASTROP BAYOU TIDAL MID CHANNEL AT NORTH END OF BASTROP BEACH ROAD 350 M DOWNSTREAM OF FM 523 SE OF ANGLETON	18504	1105	11	12	HG	UI	RT	4	4	4					
BASTROP BAYOU TIDAL 38 M NORTH OF N END OF COMPASS DR/BRAZORIA CR 504 APPROXIMATELY 4.4 KM DOWNSTREAM OF FM 523 SE OF ANGLETON	18505	1105	11	12	HG	UI	RT	4	4	4			4	4	
AUSTIN BAYOU IMMEDIATELY UPSTREAM OF DANBURY-ANGLETON ROAD/BRAZORIA CR 210 EAST OF DANBURY	18506	1105C	11	12	HG	UI	RT	4	4	4	4		4		
FLORES BAYOU IMMEDIATELY UPSTREAM OF DANBURY-ANGLETON ROAD/BRAZORIA CR 210 EAST OF ANGLETON	18508	1105A	11	12	HG	UI	RT	4	4	4	4				
MUSTANG BAYOU IMMEDIATELY UPSTREAM OF EAST SOUTH STREET 85 METERS WEST OF SOUTHBOUND SH 35 IN ALVIN USGS ID 8077890	18554	2432A	24	12	HG	UI	RT	4	4	4	4				
UNNAMED TRIBUTARY OF CLEAR CREEK TIDAL IN FOREST PARK CEMETERY IMMEDIATELY UPSTREAM OF S FEEDER RD	18591	1101F	11	12	HG	UI	RT	4	4	4	4				

OF I 45/GULF FWY S OF NASA RD 1 IN WEBSTER															
UNNAMED TRIBUTARY OF MOSES LAKE AT STATE LOOP 197/25TH AVE NORTH 432 M EAST OF NORTHBOUND SH 146 IN TEXAS CITY	18592	2431C	24	12	HG	UI	RT	4	4	4					
HIGHLAND BAYOU DIVERSION CANAL MID CHANNEL AT SECOND STREET BRIDGE 467 M UPSTREAM OF PRICE ROAD WWTP RELEASE IN HITCHCOCK	18593	2424G	24	12	HG	UI	RT	4	4	4					
UNNAMED TRIB OF MARYS CREEK 8 M DOWNSTREAM OF THALERFIELD DR E OF OLD CHOCOLATE BAYOU RD/BRAZORIA CR 89 APPROX 300 M UPST SILVER LAKE WWTP	18636	1102G	11	12	HG	UI	RT	12	4	4	12				ADDED in FY21 at request of assessor
MARYS CREEK BYPASS AT EAST BROADWAY ST/FM 518 WEST OF SUNSET MEADOWS DR IN PEARLAND	18639	1102F	11	12	HG	UI	RT	4	4	4	4				
WILLOW BAYOU AT BAKER ST 404 M UPSTREAM OF FM 2004 SOUTH OF SANTA FE IN GALVESTON COUNTY	18668	2432B	24	12	HG	UI	RT	4	4	4	4				
ENGLISH BAYOU MID BAYOU 250 M EAST AND 83 M SOUTH OF 61ST ST BRIDGE CENTERPOINT IN GALVESTON	18695	2424E	24	12	HG	UI	RT	4	4	4			4	4	
CLEAR CREEK ABOVE TIDAL AT YOST ROAD TERMINUS IN PEARLAND IN BRAZORIA COUNTY	20010	1102	11	12	HG	UI	RT	4	4	4	4				
SAN BERNARD RIVER TIDAL AT SH 35 SOUTHWEST OF WEST COLUMBIA	20460	1301	13	12	HG	UI	RT	4	4	4					
WEST BERNARD CREEK AT WHARTON CR 225 EAST OF HUNGERFORD	20721	1302B	13	12	HG	UI	RT	4	4	4	4		4		
PEACH CREEK AT WHARTON CR 117/CHUDALLA ROAD/ARCHER ROAD 89 METERS SOUTH OF THE INTERSECTION OF WHARTON CR 117/CHUDALLA ROAD/ARCHER ROAD AND WHARTON CR 121/ WHARTON CR 119/DONALDSON ROAD IN EAST OF WHARTON	20722	1302D	13	12	HG	UI	RT	4	4	4	4		4		

MOUND CREEK AT BRAZORIA CR 450/JACKSON SETTLEMENT ROAD 1.22 KILOMETERS UPSTREAM OF FM 1301 IN WEST OF WEST COLUMBIA	20723	1302E	13	12	HG	UI	RT	4	4	4	4		4		
BORDENS GULLY AT SPRUCE DRIVE IN DICKINSON	20724	1103B	11	12	HG	UI	RT	4	4	4	4		4		
UNNAMED TRIBUTARY OF GUM BAYOU AT OWENS DRIVE 1.51 KILOMETERS UPSTREAM OF CONFLUENCE WITH GUM BAYOU IN DICKINSON	20728	1103G	11	12	HG	UI	RT	4	4	4					
CARY BAYOU IMMEDIATELY UPSTREAM OF RACCOON DRIVE BRIDGE IN BAYTOWN	21079	0901A	9	12	HG	UI	RT	4	4	4			4		ADDED in FY21 at request of assessor
CHOCOLATE BAYOU IMMEDIATELY UPSTREAM OF BRAZORIA CR 171 / MUSTANG CHOCOLATE BAYOU ROAD IN LIVERPOOL	21178	1107	11	12	HG	UI	RT	4	4	4					
MUSTANG BAYOU AT THE HEIGHTS-MANVEL ROAD /CARDINAL DRIVE BRIDGE NEAR ALVIN	21416	2432A	24	12	HG	UI	RT	4	4	4	4				
BRUSHY BAYOU AT FM 213	21734	1105E	11	12	HG	UI	RT	4	4	4	4				ADDED again in FY2022
UNNAMED TRIBUTARY OF BASTROP BAYOU TIDAL AT BRAZORIA CR 213 / SHELL ROAD 7.0 KILOMETERS EAST OF ANGLETON	21735	1105D	11	12	HG	UI	RT	4	4	4	4		4		
TURKEY CREEK AT BEAMER ROAD 1.5 KM SOUTHEAST OF FM 1959/DIXIE FARM ROAD IN FRIENDSWOOD	21925	1102D	11	12	HG	UI	RT	4	4	4	4				
AUSTIN BAYOU TIDAL 1.60 KILOMETERS UPSTREAM OF THE CONFLUENCE WITH BASTROP BAYOU TIDAL IN BRAZORIA COUNTY	22012	1105B	11	12	HG	UI	RT	4	4	4			4	4	
ARMAND BAYOU TIDAL 100 M BELOW THE CONFLUENCE WITH SPRING GULLY	22187	1113	11	12	HG	UI	RT	4	4	4			4	4	
COTTON BAYOU 10 METERS UPSTREAM OF WESTBOUND IH-10 FRONTAGE ROD IN MONT BELVIEU	22232	0801E	8	12	HG	UI	RT	12	12	12	12		4		ADDED in FY2021

QAPP AMENDMENT 2

Appendix C: Station Location Maps

Replacement map: FY23 Coordinated Monitoring Schedule

Station Location Maps

A map of stations monitored by the H-GAC and all subparticipants are provided below. The map was generated by H-GAC. This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries. For more information concerning this map, contact the Jessica Casillas at 713-993-4594 or Jean Wright at 713-499-6660.

H-GAC's FY2023 Regional Coordinated Monitoring Stations

Coordinated Monitoring Stations

- Houston Health Department (HH)
- Environmental Institute of Houston (UI)
- Houston-Galveston Area Council (HG)
- Texas Research Institute for Environmental Studies (TF)
- San Jacinto River Authority (SJ)
- Harris County Pollution Control (HC)
- Houston Drinking Water Operations (HW)
- HG 24-Hour Dissolved Oxygen Sites
- UI - Flow and Field Parameters
- UI 24-Hour Dissolved Oxygen Sites

Walker County
Montgomery County
Waller County
Harris County
Liberty County
Chambers County
Austin County
Colorado County
Fort Bend County
Wharton County
Galveston County
Brazoria County
Matagorda County

N

0 2.5 5 10 15 20 KM

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Data Source: H-GAC
Last Update: Aug 08, 2022

Houston-Galveston Area Council

QAPP AMENDMENT 2

Appendix D: Field Data Sheets

contains replacement page 86 for TRIES field sheet only

Texas Research Institute for Environmental Studies - Sam Houston State University

Clean Rivers Program Field Data/Sampling Sheet

Station ID:_____ Date:_____ Time of Water Sample Collection: _____

Location:_____ Lat:_____ Long:_____

Collected By:_____

FIELD MEASUREMENTS (If < 0.5m (50cm) - record at 1/3 of depth from the surface. If between 0.5m (50cm) & 1.5m (150cm) deep - record @ 0.3m (30 cm) from surface).

	1	2	3	4	5
Temp (C)					
Conductivity (uS)					
DO mg/L					
pH					
Sample Depth (cm/m)					

FIELD OBSERVATIONS

_____ TOTAL DEPTH (cm/m)

_____ WATER ODOR 1-sewage 2-oily/chemical 3-rotten egg 4-musky 5-fishy 6-none 7-other

_____ WATER SURFACE 1-calm 2-ripples 3-waves 4-whitecap

_____ WIND INTENSITY 1-calm 2-slight 3-moderate 4-strong

_____ WATER COLOR 1-brownish 2-reddish 3-greenish 4-blackish 5-clear 6-other

_____ WATER CLARITY 1-EXCELLENT 2-GOOD 3-FAIR 4-POOR

_____ OBSERVED WATER TURBIDITY 1-LOW 2-MEDIUM 3-HIGH

_____ PRESENT WEATHER 1-clear 2-partly cloudy 3-cloudy 4-rain 5-other

_____ FLOW SEVERITY 1-no flow 2-low 3-normal 4-flood 5-high 6-dry

_____ FLOW (cfs)

_____ FLOW METHOD 1-gage 2-electric 3-mechanical 4-weir/flume 5-doppler

_____ SECCHI TUBE (cm/m)

_____ DAYS SINCE LAST SIG. RAINFALL (> or = 0.50 inches)

_____ Primary Contact Rec. Observed (# of people observed)

_____ Evidence of Primary Contact Rec. Observed 0= no evidence observed, 1= evidence observed

WATER SAMPLES

☐ FRESH (Non-Tidal) ☐ MARINE (Tidal)

☐ *E. coli* ☐ *Enterococcus*

_____ Field Split Collected (yes/no)

Container	Preservative	Analysis Requested	Comments
1 x 200ml - Plastic	Ice, $Na_2S_2O_3$ tablet	Bacteria (Entero and/or E. coli)	
1 x 1L - Plastic	Ice	TSS	
1 x 250 ml - Plastic	Ice	Cl, NO_3, NO_2, SO_4	
1 x 1L - Plastic	Ice, H_2SO_4	TKN	
1 x 125 ml - Plastic	Ice, H_2SO4	NH_3	
1 x 125 ml - Plastic	Ice, HNO_3	T PO_4	

ADDITIONAL INFORMATION & REMARKS

* If site is dry, determine if there is any pool with 500m reach, If pool(s) exists (> 10 m in length and 0.4m deep) record: Lat _____ Long_____ of largest pool in reach Maximum pool width_____(m), Maximum pool depth _____ (m), Pool length _____(m), and percent pool coverage in 500m reach _____%.

Texas Research Institute for Environmental Studies - Sam Houston State University

Clean Rivers Program Field Data/Sampling Sheet

Station ID:_____ Date:_____ Time of Water Sample Collection: _____

Location:_____ Lat:_____ Long:_____

Collected By:_____

FIELD MEASUREMENTS (If < 0.5m (50cm) - record at 1/3 of depth from the surface. If between 0.5m (50cm) & 1.5m (150cm) deep - record @ 0.3m (30 cm) from surface).

	1	2	3	4	5
Temp (C)					
Conductivity (uS)					
DO mg/L					
pH					
Sample Depth (cm/m)					

FIELD OBSERVATIONS

	TOTAL DEPTH (cm/m)		PRESENT WEATHER 1-clear 2-partly cloudy 3-cloudy 4-rain 5-other
	WATER ODOR 1-sewage 2-oily/chemical 3-rotten egg 4-musky 5-fishy 6-none 7-other		FLOW SEVERITY 1-no flow 2-low 3-normal 4-flood 5-high 6-dry
	WATER SURFACE 1-calm 2-ripples 3-waves 4-whitecap		FLOW (cfs)
	WIND INTENSITY 1-calm 2-slight 3-moderate 4-strong		FLOW METHOD 1-gage 2-electric 3-mechanical 4-weir/flume 5-doppler
	WATER COLOR 1-brownish 2-reddish 3-greenish 4-blackish 5-clear 6-other		SECCHI TUBE (cm/m)
	WATER CLARITY 1-EXCELLENT 2-GOOD 3-FAIR 4-POOR		DAYS SINCE LAST SIG. RAINFALL (> or = 0.50 inches)
	OBSERVED WATER TURBIDITY 1-LOW 2-MEDIUM 3-HIGH		Primary Contact Rec. Observed (# of people observed)
			Evidence of Primary Contact Rec. Observed 0= no evidence observed, 1= evidence observed

WATER SAMPLES

☐ **FRESH** (Non-Tidal)

☐ *E. coli*

Field Split Collected (yes/no)

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