

Houston Area Total Maximum Daily Load Public Participation Project

FY 2019



Multi-family Pet Waste Implementation, Photo by H-GAC

Houston Area Total Maximum Daily Load Public Participation Project

ANNUAL SUMMARY REPORT

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EXECUTIVE SUMMARY

This report summarizes the work of the Houston-Galveston Area Council (H-GAC) to coordinate with local stakeholders the execution of total maximum daily load (TMDL) implementation plans (I-plans) in the region. Work performed was completed through a grant provided by the Texas Commission on Environmental Quality (TCEQ) TMDL Program for FY 2019, September 1, 2018 – August 31, 2019. The purpose of this report is to demonstrate direct and indirect benefits this grant provides to the region. H-GAC also leverages project funding to steer outside resources and implementation programs to the project area. The project area (Figure 1) includes the watershed areas contained in:

- the Bacteria Implementation Group (BIG) TMDL, green outline;
- the Upper Oyster Creek TMDL, shaded in red; and
- the Chocolate Bayou TMDL.

H-GAC worked with 175 stakeholders at 11 regional TMDL stakeholder and public meetings of which eight were the BIG or BIG work group meetings, one a meeting of the East and West Fork of the San Jacinto River Watershed (E&W) committee, one the annual meeting of the Upper Oyster Creek (UOC) committee, and one with the Chocolate Bayou coordination committee (CC). H-GAC also provided support for local and regional watershed-based plan (WBP) implementation, including TMDL implementation plans (I-Plan) and watershed protection plans (WPP). H-GAC throughout FY 2019 supported implementation through 33 outreach and extension activities by providing or participating in: 6 presentations, 6 technical workshops, 5 exhibit events, 3 training events, 5 partner planning and implementation meetings or workshops and leveraged 8 local and regional plan implementation activities.

KEY HIGHLIGHTS AND DIRECT MEASURES OF SUCCESS

- 1) H-GAC completed the *2018 BIG Annual Report* in December 2018. The final 2018 report is provided as an attachment. H-GAC also produced the draft *2019 BIG Annual Report*. The 2019 draft Annual Report documents the progress for each of the implementation activities laid out in the BIG I-Plan for the 2018 calendar year. A summary of the draft 2019 report is provided below. The draft report has also been provided as an attachment.
- 2) H-GAC worked with stakeholders initiating measures of the *Implementation Plan for Two Total Maximum Daily Loads for Dissolved Oxygen and One Total Maximum Daily Load for Bacteria in Upper Oyster Creek*. The *2019 Annual Implementation Report* was created to track stakeholder's implementation efforts and implementation successes. A summary is provided below. A copy of the full report is attached.
- 3) H-GAC presented the results of BIG 2018 implementation to the E&W of the San Jacinto River (E&W Fork) TMDL stakeholders on July 23, 2019. Continued meetings of the E&W Fork seek to fully integrate the stakeholders within the BIG and to encourage implementation of the I-Plan within the watershed.
- 4) Implementation Database and Project Website. H-GAC continued to maintain and update the implementation reporting database. H-GAC also continues to maintain and update the H-GAC TMDL website. Both deliverables can be found at: <http://www.h->

gac.com/community/water/tmdl/big/default.aspx. The database is found under the Interactive BIG Report button.

- 5) A draft Chocolate Bayou I-plan was delivered to TCEQ.
- 6) Supplemental Implementation Activities – H-GAC leveraged project funding to expand implementation activities throughout the BIG project area.
 - a. WBPs,
 - b. On-site sewage facility (OSSF) outreach and implementation
 - c. Water Innovation Strategies of Excellence (WISE) Awards
 - d. Illicit Discharge Detection,
 - e. Continued expanded CRP Monitoring of the East Fork of the San Jacinto River, and
 - f. Low Impact Development Outreach and Implementation;
 - g. Coastal Communities Nonpoint Source Outreach; and
 - h. Bacteria Source Tracking.

INTRODUCTION

H-GAC under grant by the TCEQ TMDL Program provided public outreach support to two ongoing TMDL projects in the Houston-Galveston region, the Bacteria Implementation Group and Upper Oyster Creek. Additionally, work included support and development of an I-Plan for the Chocolate Bayou watershed.

The primary goal of this grant was to:

- 1) oversee and track implementation with support from watershed stakeholders in each project area,
- 2) provided an opportunity for communication between stakeholders and the public,
- 3) support watershed implementation activities captured in the TMDL I-Plans; and
- 4) work with stakeholders to develop the Chocolate Bayou I-Plan.

Support of these stakeholder groups and helping to direct implementation activities within each watershed is expected to result in long-term water quality improvements within the project area and assist other regional watershed planning and implementation efforts (Figure 1) in the H-GAC 13 county planning region.

FY 2019 PUBLIC OUTREACH IN SUPPORT OF TMDL I-PLANS

H-GAC facilitated stakeholder meetings within the BIG, E&W TMDL, UOC TMDL and Chocolate Bayou project areas during FY 2019.

Meetings held in FY 2019 are listed below.

- 1) H-GAC held two BIG stakeholder group meetings in FY2019: October 23, 2019 (48 attendees) and June 4, 2019 (37 attendees).

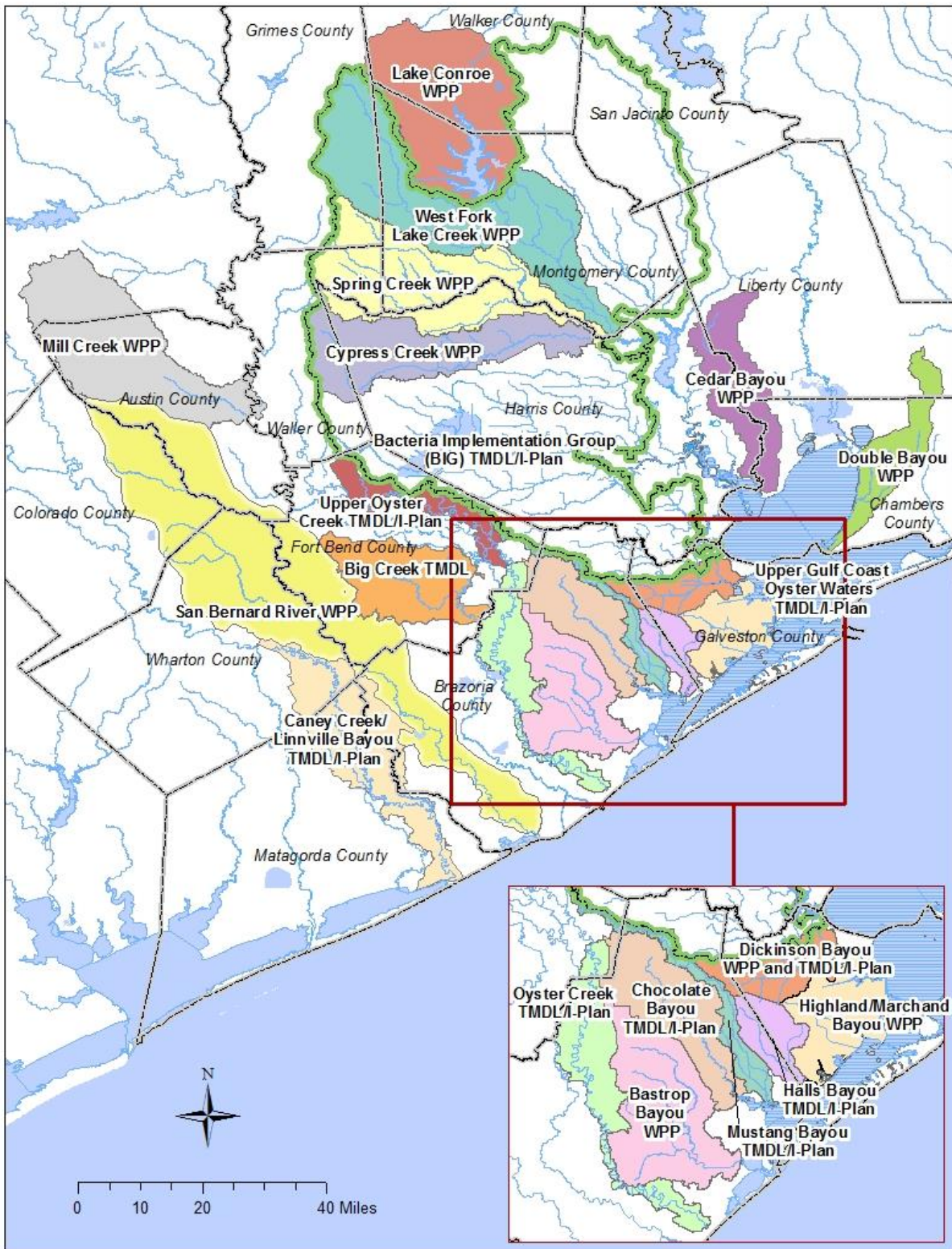


Figure 1. Houston-Galveston Region TMDL and WPP Project Areas

- 2) H-GAC supported 6 BIG workgroup meetings which discussed implementation progress, achievements, potential changes to the I-Plan requiring final BIG approval, and preparation for the BIG annual meeting. Workgroup meetings included:
 - a) October 15, 2018. Coordination and Policy work group met. Eleven stakeholders were in attendance.
 - b) March 4, 2019. Coordination and Policy work group met. Thirteen stakeholders were in attendance.
 - c) May 6, 2019. Coordination and Policy work group met. Twelve stakeholders were in attendance.
 - d) May 6, 2019. OSSF/Illicit Discharge work group met. Eight stakeholders were present.
 - e) May 23, 2019. Animals and Agriculture work group met. Six stakeholders attended the meeting.
 - f) July 23, 2019. Coordination and Policy workgroup. Fourteen stakeholders were present.
- 3) H-GAC supported the E&W TMDL implementation process by holding a coordination committee meeting on July 24, 2019. Five stakeholders were present at the meeting.
- 4) H-GAC lead the UOC Annual Implementation meeting on April 11, 2019 to seek stakeholder input on implementation activities carried out in the TMDL project area. Seventeen stakeholders were in attendance.
- 5) H-GAC facilitated the Chocolate Bayou coordination committee meeting on June 13, 2019 at the Brazoria County Public Library in Alvin, TX. Four stakeholders were in attendance.

FY 2019 REGIONAL IMPLEMENTATION OF WATERSHED BASED PLANS

H-GAC provided technical assistance and implementation support for Houston Region TMDL I-Plan and coordination with other WBPs in the region (Figure 1). Technical assistance was provided through 18 topical workshops, technical presentations, exhibits at community events, and Texas Stream Team volunteer training. H-GAC also provided implementation support by leveraging outside resources to carry-out eight implementation projects; working with stakeholders and project partners to continue program efforts; and to lend technical staff to assist with new implementation initiatives. The technical workshops, presentations, events, training and implementation support held in FY 2019 are listed below.

TECHNICAL ASSISTANCE AND OUTREACH

- 1) Three H-GAC Clean Waters Initiatives Workshops were held at H-GAC with topics related to TMDL I-Plan implementation –
 - a. February 26, 2019 – Infrastructure Funding to Improve Water Quality
 - b. May 22, 2019 – On-site Sewage Facility Remediation Projects
 - c. August 8, 2019 – Water Conservation, Reuse and Pollution Education
- 2) October 11, 2018 – staff presented on TMDL success in the Houston region at the TCEQ Autumn Environmental Conference and Expo.
- 3) October 18, 2018 – staff attended and provided an education booth at the Bayou Preservation Association Symposium, Houston, TX.

- 4) November 7, 2018 – staff attended and provided content to the Regional Stormwater Quality Education Workgroup, a stakeholder group to the Coastal Communities 319 grant covering non MS4 coastal areas.
- 5) November 7, 2018 – staff provided support to Low Impact Development workshop presenting project results from the LID Support to Local Governments (more on this topic under Associated Implementation Support).
- 6) November 14, 2018 – staff attended and provided content to the Galveston Bay Foundation’s Boater Waste work group.
- 7) November 29, 2018 – staff presented to Woodland GREEN on water quality in the West Fork of the San Jacinto River.
- 8) December 6, 2018 – staff attended and provided TMDL updates to the Galveston Bay Estuary Program (GBEP) WSQ meeting.
- 9) February 15, 2019 – Texas Stream Team (TST) training was provided to stakeholders in Houston.
- 10) February 21, 2019 – Environmental Enforcement workshop was held to discuss illegal dumping.
- 11) February 21, 2019 – staff presented on TMDLs to watershed groups on the Texas Border in McAllen, TX.
- 12) March 7, 2019 – staff attended and provided TMDL updates to the GBEP WSQ meeting.
- 13) March 30, 2019 – Rivers, Lakes, Bays, and Estuaries TrashBash©. Staff attended event locations across the project area. Provided general water quality outreach, including pet waste, FOG and low impact development management measures.
- 14) April 27, 2019 – City of Pearland Earth Day. Staff provided general water quality outreach, including pet waste, and FOG management measures (Figure 2).



Figure 2. Pet waste Education at City of Pearland Earth Day, April 27, 2019

- 15) April 27, 2019 – Kickerillo Preserve Nature Event. Staff provided general water quality outreach, including pet waste, and FOG management measures.
- 16) May 18, 2019 – Bay Day at Kemah Boardwalk. Staff provided general water quality outreach, including pet waste, and FOG management measures (Figure 10).
- 17) May 18, 2019 – Agriculture Landowner Workshop in Conroe. Staff with other ag. resource agencies hosted a workshop to collaborate with local landowners. June 6, 2019 – Staff presented at the Montgomery County OSSF conference.
- 18) May 21, 2019 – staff presented to the Harris County OSSF Seminar
- 19) June 6, 2019 – staff presented at the Montgomery County OSSF conference.
- 20) June 12, 2019 – staff presented at the Green Infrastructure for Texas workshop in Pearland, TX.
- 21) June 21, 2019 – staff attended the GBEP Water and Sediment Quality Subcommittee and provided TMDL project updates.
- 22) August 30, 2019 – staff held an OSSF homeowner training at two locations in Montgomery County.

ASSOCIATED IMPLEMENTATION SUPPORT

- 1) WPP Development and Support within the BIG: H-GAC staff coordinate the WBP efforts between TMDL I-Plans and WPPs. West Fork of the San Jacinto River WPP – was completed and received EPA approval. The plan can be accessed at: <https://westfork.weebly.com/>. H-GAC kicked-off the Cypress Creek WPP project in FY2019. H-GAC received confirmation that the 319 Program will fund in FY20 the Spring WPP.
- 2) OSSF SEP: H-GAC has an ongoing Supplemental Environmental Project (SEP) project and has received funding through TCEQ and from Harris County District Attorney’s Office to repair and replace failing systems. H-GAC is providing outreach and repairs targeting failing OSSFs in areas with watershed-based plans, including those in the BIG project area. For more information on the program: <http://h-gac.com/community/water/ossf.aspx>.
- 3) WISE Awards: the first annual Water Innovation Strategies of Excellence (WISE) Awards were given out for four categories – Education, Planning, Built less than \$500K, and Built greater than \$500K (Figure 3). The awards program implements activity 4.4 of the BIG I-Plan to identify and recognized important key projects that address bacteria and implement a measure within the I-Plan. More information on the WISE awards can be found online at: <http://www.h-gac.com/board-of-directors/advisory-committees/natural-resources-advisory-committee/wise-awards.aspx>.



Figure 3. Water Innovation Strategies of Excellence Awards Logo
Summary Report

- 4) Illicit Discharge Detection: H-GAC is coordinating with the Bayou Preservation Association to address illicit discharges and sanitary sewer overflows using grant funding from the Galveston Bay Estuary Program. Project will get underway in FY2020.
- 5) East Fork Monitoring: H-GAC continued increased monitoring of the upper reaches of the East Fork of the San Jacinto River. Ten additional monitoring sites, maintained by the Texas Research Institute for Environmental Studies at Sam Houston State University, were added in FY17. H-GAC will be looking to find support to complete a WPP in this watershed.
- 6) LID Support to Local Governments: H-GAC completed a LID project funded by a grant from the Galveston Bay Estuary Program (GBEP) to assist local governments review ordinances and provide recommendations to enhance the use of LID within their jurisdiction. Funding supported work with the City of Pearland. H-GAC was able to expand the work to include the City of Mont Belvieu using available 319 grant funds for work being carried out for the Cedar Bayou WPP. Sample maintenance agreements, maintenance checklists, maintenance schedules and LID ordinances can be found under the LID resource tab of the H-GAC LID webpage: <http://www.h-gac.com/low-impact-development/default.aspx>.
- 7) Coastal Communities: H-GAC is coordinating a coastal watershed effort using 319 grant funds and local foundation funding to advance onsite sewage and FOG implementation. The FOG practices impact the Houston region with implementation in the Clear Creek watershed. More information on the Coastal Communities program can be found online at: <http://www.h-gac.com/coastal-communities/default.aspx>
- 8) Bacteria Source Tracking: The BIG I-Plan set a goal to increase BST research and seek to differentiate human from other sources of fecal bacteria as research methods improve. H-GAC provided guidance to the Texas Water Resource Institute (TWRI) on monitoring locations within the BIG project area to collect bacteria samples for bacteria source tracking (BST). TWRI was provided grant funding by GBEP to collect tidal water BST samples. TWRI presented early findings to the BIG at the Spring meeting.

SUMMARY OF PROJECT FINDINGS

H-GAC staff spent the bulk of FY 2019 working with three area watershed stakeholder groups; gathering and tracking implementation data; completing the 2018 BIG Annual Report, drafting the 2019 BIG Annual Report and the 2019 Upper Oyster Creek Annual Report; drafting the Chocolate Bayou I-Plan and supporting stakeholder processes in BIG, UOC, and E&W watersheds. H-GAC held 11 stakeholder meetings in support of watershed planning and implementation. This was fewer meetings when compared to the previous report. However, the attendance rate for 2019 was up at most meetings, averaging nearly 16 persons/meeting. This is up from the average of 12 persons/meeting in 2018. Meeting agendas, presentations and other related documents can be found on the BIG project website, <http://h-gac.com/community/water/tmdl/BIG/meeting-materials.aspx> or the Upper Oyster Creek website, <http://www.upperoystercreek.com/>.

BIG IMPLEMENTATION

The thirty-three member BIG (Figure 4) completed its sixth year of implementation since the Implementation Plan for Seventy-Two Total Maximum Daily Loads for Bacteria in the Houston-Galveston Region was approved on January 30, 2013. The BIG stakeholders met in two stakeholder meetings and six work group meetings throughout the course of the fiscal year (Listed on Page 8). The BIG approved the 2018 Annual Report in December 2018 and kicked-off the I-plan revision process.

The stakeholders began the 2019 Annual Report by reporting on implementation activities at the six work group meetings and through email correspondence for actions carried out in the 2018 calendar year. The regional implementation activity results were then captured by H-GAC staff, presented at the BIG Spring meeting on June 4, 2019 and recorded in the draft annual report, *2019 BIG Annual Report*.

The draft report will be provided to the Coordination and Policy work group scheduled for October 2, 2019 to begin the review process. The Coordination and Policy work group will review the document and provide comments and suggest edits. The draft report will use the new format from FY 2018. H-GAC will then finalize the document and present it at the BIG Fall meeting on October 29, 2019. The BIG will review and approve the document during the meeting.



Figure 4. BIG meeting, October 25, 2016

The BIG began revising the I-Plan in FY19 to update the document and to address the requested changes from the addition of the Jarbo Bayou and E&W watersheds to the BIG. Both watersheds added potential sources not captured in the first edition; forest management and waste from the boating community. The East Fork of the San Jacinto River added large areas of national forest land to the BIG. Tidally influenced, Jarbo Bayou drains to Clear Lake and Galveston Bay, waterbodies with boating activity and where many of the boats contain heads and/or are used for living year-round as live aboards. There is the potential for illicit discharge of waste as Clear Lake is a designated No Discharge Zone. The I-Plan will be brought up-to-date and include forest and boater waste management measures. The I-Plan revision is anticipated to be completed in December 2019.

SUMMARY OF THE 2019 DRAFT ANNUAL REPORT

The BIG implementation effort continues to sustain improved ambient bacteria levels across the project area (Table 1, Figure 5). There are 226 assessment units (AU) in the BIG watershed. A review of the Surface Water Quality Monitoring (SWQM) data found that 57 of the AUs were improving for fecal bacteria (*Escherichia coli* (*E.coli*) or Enterococci). Only eight were found to be deteriorating while the remaining 161 exhibited no change (Table 1). The bacteria geometric trend line while leveling out in recent years, was found to still be significantly less at four times the standard from eight times the standard back in the year 2005 (Figure 5).

Table 1. SWQM parameters in 226 Assessment Units in the BIG watershed

| Parameter | Deteriorating | Improving | No Change |
|---------------------------------------|---------------|-----------|-----------|
| Dissolved Oxygen grab screening level | 42 | 26 | 158 |
| <i>E. Coli</i> | 5 | 45 | 108 |
| Enterococci | 3 | 12 | 53 |
| Nitrate-N | 69 | 30 | 127 |
| Total Phosphorus | 70 | 30 | 126 |

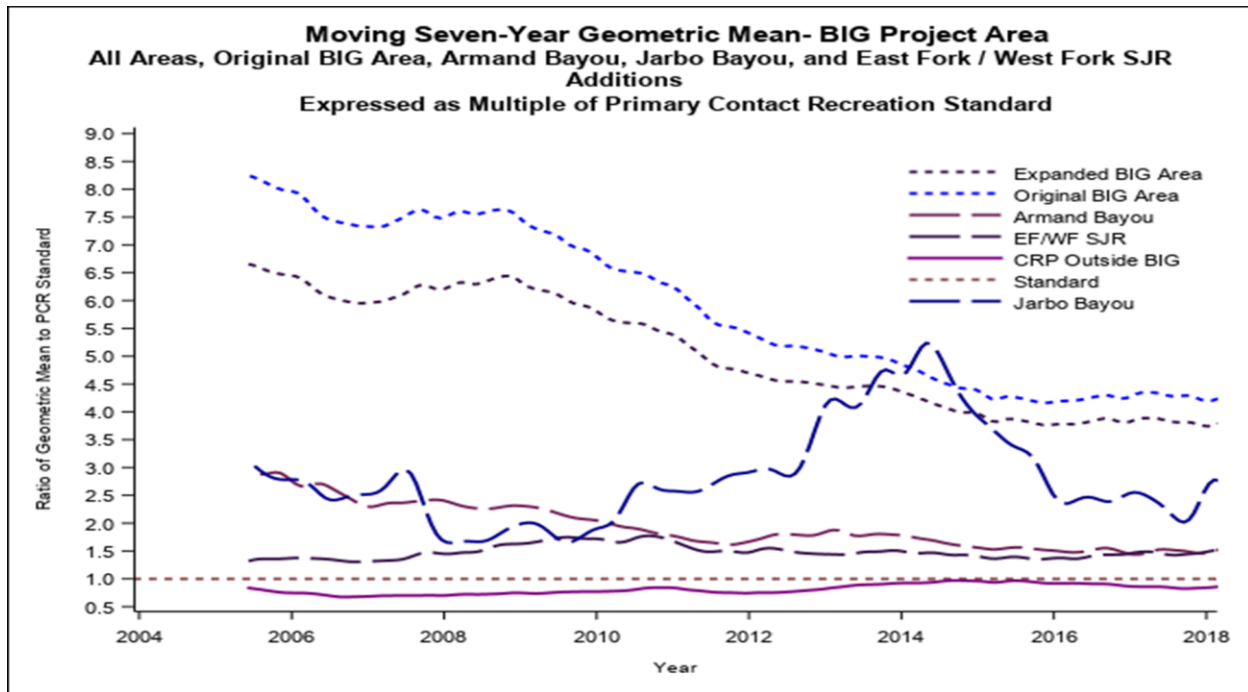


Figure 5. Seven Year Bacteria Trend for the BIG project area

Figure 5 presents two trend lines for the BIG, one covering the project area for the original 72 TMDLs covered in the I-Plan approved in 2013 and the other trend line for the expanded project area covering 103 TMDLs, which includes the original project area plus the Armand Bayou, E&W and Jarbo Bayou TMDL project areas. Including the additional project areas lowers the trend line due to the lower bacteria geometric means found in the added watersheds.

The individual bacteria trend lines for Armand Bayou, E&W and Jarbo Bayou TMDL projects areas are also included in Figure 5. The final trend line covers H-GAC's Clean Rivers Program project area outside of the expanded BIG project area to serve as a reference line. That trend just below TCEQ's contact recreation standard. To standardize the graph to account for different *E. coli* and enterococci standards, the data have been divided by the appropriate standard. This is the reason the standard line is set at 1.0.

The overall bacteria reduction, while not definitive, has been attributed to BIG member organizations implementing a variety of best management practices, including: geographically targeting water bodies with exceedingly high levels of bacteria in search of illicit connections; prioritizing and rehabilitating aging infrastructure, prioritizing chronically malfunctioning onsite sewage facilities for abandonment and connection to a WWTF; carrying out targeted outreach education, including pet waste and fats, oils and grease; and implementing and encouraging the use of structural practices such as low impact development or green infrastructure (Figure 6).

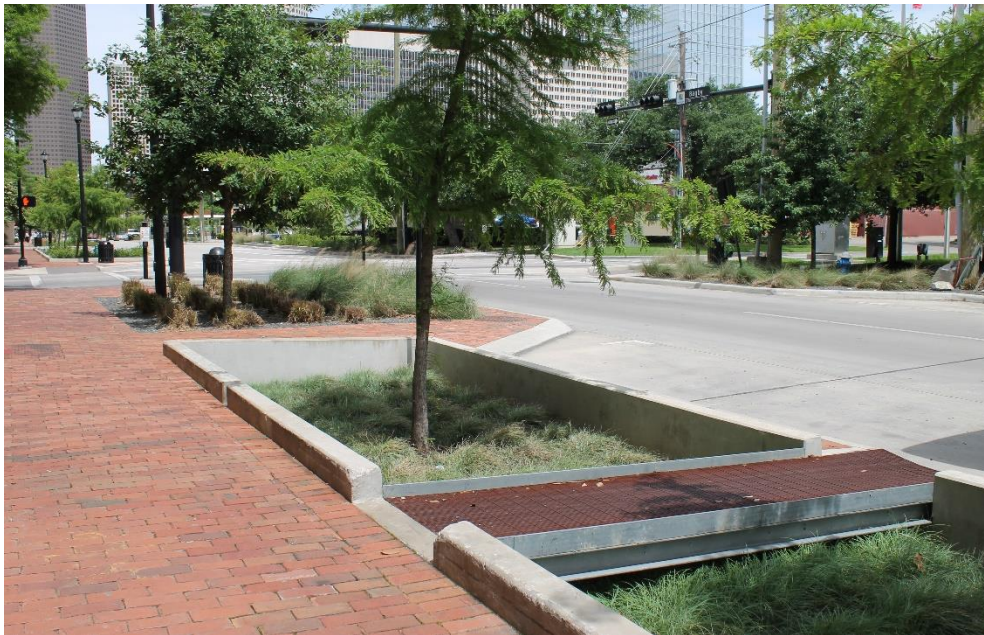


Figure 6. Bio-retention on Bagby Street, Houston, TX an example of low impact development in the region

A summary of key highlights of the draft *2019 Annual Report* follows (*Note – information presented below, and the attached draft is subject to change based on reviews from the BIG*):

The 2019 report describes implementation progress and highlights successful model projects. Three specific projects were reported:

- 1) The OSSF SEP,
- 2) 2019 WISE, and
- 3) The Designing for Impact: Addressing Municipal Barriers.

Each of these projects addresses different strategies of the I-Plan. The SEP project targets homeowner OSSF education and if qualified based on income, repair or replacement of a failing systems. This project implements strategy 3.1. The WISE award implements strategy 4.4 to develop a recognition program. The Designing for Impact project worked with communities and advanced strategy 4.5 in providing a Circuit Rider Program, best practice technical assistance.

I-PLAN STRATEGY ACHIEVEMENTS IN 2018

The annual report records the BIG's achievements for all of the I-Plan's 38 activities. Overall, six activities have been completed and 32 are In Progress. The six completed activities and five of the In-Progress activities have been placed into Tracking to evaluate changes over time or are identified to be reviewed during the I-Plan update. Three activities were considered Ahead of Schedule and 24 On Schedule. Each activity is also assessed based on the BIG partner's efforts to advance the activity over the year: Behind Schedule, On Schedule, Ahead of Schedule, or Completed and in Tracking (Figure 7). Completed and in Tracking signifies that the activity has been completed and the BIG will continue to track. In a future I-Plan update, the activity will be reviewed to determine if a new activity is needed, a change to the assessment measure is required, or if the activity should continue and be tracked

1.0 Waste Water Treatment Facilities:

1. A review of discharge monitoring reports (DMR) finds that there were 636 active waste water permits within the BIG project area. Of those 552 DMR reports in 2018, with 527 (510 domestic and 17 industrial) reporting bacteria. 449 or 84% reported with bacteria limits of 63 MPN/100 mL.
2. WWTF DMR report 97.7 percent compliance with their permit limit. Harris County Pollution Control Service reported for the same period, 93.3 percent compliance for those WWTFs inspected by the county.
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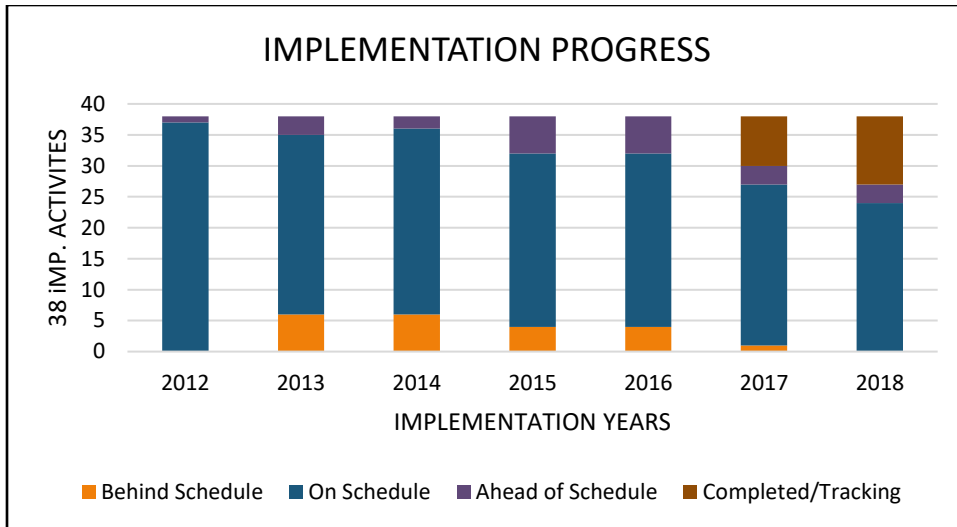


Figure 7. Implementation tracking for all 38 I-Plan Activities

2.0 Sanitary Sewer Systems:

1. TCEQ Region 12 reported they were behind on loading reported SSOs from local permit holders due to a lack of staff. H-GAC will provide a review of reported SSOs once the data has been fully loaded.
2. Education – Asset management and FOG were the focus of workshops and educational outreach to operators, water professionals and the public. H-GAC through a 319 grant is working in the Coastal region on stormwater management. One FOG project includes the city of Pearland and will look at multi-family homes.

3.0 Onsite Sewage Facilities (OSSFs):

1. Updated OSSF locations where there are over 44,914 permitted OSSFs in the BIG project area (Figure 8). The number increased in 2016 due to the expanded project area.
2. There are an estimated 172,537 grandfathered OSSFs in the project area.
3. Establishing target areas for future maintenance, repair and education. Funding to a TCEQ approved H-GAC OSSF SEP in the H-GAC region is underway. Harris County began provides funds to H-GAC to support OSSF maintenance and repair from fines the county receives from enforcement.
4. Harris County and the East Aldine Management District continued to address failing OSSFs in the East Aldine area through abandonments and hookups to a nearby WWTF.
5. Education and Training – Homeowners, Real Estate Agents, Waste Professionals workshops and training events were carried out during the year.

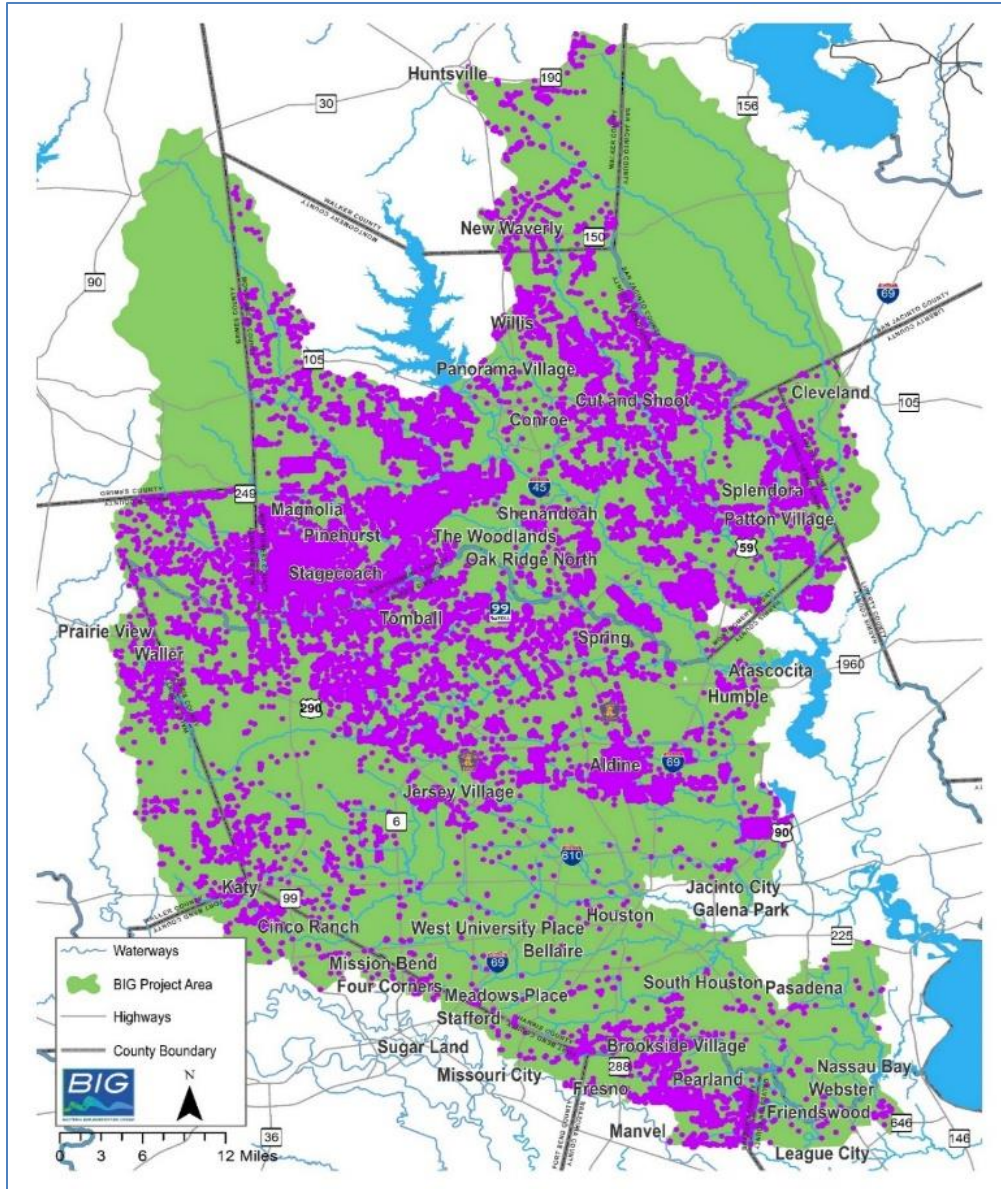


Figure 8. Location of BIG Project Area Onsite Sewage Facilities

4.0 Stormwater Systems:

1. Over 130 municipal separate storm sewer systems (MS4) permittees within the BIG.
2. H-GAC completed a LID project with the City of Pearland to review codes and ordinances and look for ways the city can enhance the use of LID. The report includes sample code/ordinances and maintenance agreements.
3. Education and training provided to MS4 operators.
4. H-GAC completed the first annual WISE awards recognition program, targeting organizations implementing water quality related BMPs.

5.0 Construction:

1. Harris County and City of Houston report improved compliance at construction sites found through providing training during routine inspections.
2. Education and training provided to MS4 operators.

6.0 Illicit Discharges and Dumping:

1. Phase II operators report having regulatory mechanisms and detection programs.
2. H-GAC is collaborating with the Bayou Preservation Association on a new detection project.
3. MS4s are encouraging use of citizen reporting tools like the Galveston Bay Foundation's Galveston Bay Action Network and Clean Bayou.org to help identify SSOs and illicit discharges.

7.0 Animals and Agriculture:

1. Work group recommending study on increasing incentives to encourage the use of water quality management plans and conservation plans.

8.0 Residential:

1. Pet Waste and FOG Education, Outreach and Activities provided throughout the region (Figure 9). Variety of online educational resources covering: FOG, Pet Wastes, and Sanitary Wipes.
2. Training – Homeowner and Real Estate OSSF training, MS4s, LID practices.



Figure 9. Fats, Oils, and Grease Education at Bay Day – Kemah Boardwalk, May 18, 2019

9.0 Monitoring:

1. CRP continues to provide ambient monitoring to the BIG project area.
2. Regional BMP Database.

3. BMP effectiveness monitoring of demonstration sites is ongoing.
4. Annual report and assessment completed on annual basis. Online implementation database is available at:

<http://h-gac.maps.arcgis.com/apps/MapSeries/index.html?appid=a75ba4bb46ca40658066c5755a8dba6e>.

10.0 Research:

1. BMP Effectiveness Monitoring is being capture on projects throughout the region.
2. Texas Water Resource Institute is conducting source bacteria analysis.

11.0 Geographic Focus:

1. H-GAC completed the IDDE project using a grant from GBEP to develop standard methods for IDDE and monitoring for illicit discharges. Project was based on geographic focus to identify areas for monitoring. H-GAC is collaborating with the BPA to start new project in 2019.

UPPER OYSTER CREEK IMPLEMENTATION

Seventeen stakeholders attended the UOC committee meeting on April 11, 2019 in Sugarland, to share implementation activities. From the information provided by stakeholders and data gathered by H-GAC, the *2019 Annual Report* was created and is attached to this summary. Phase II stormwater permits continue to be the main bacteria reduction force in the project area (Figure 10).

The various water quality data sources indicated improvements in bacteria in some areas, but water quality challenges persisted throughout the system, and degradation was seen in some areas. Wastewater treatment facilities were generally having few if any issues meeting their permit limits for bacteria and oxygen-demanding substances. The overall contribution from sanitary sewers was consistent, though could be acute in localized areas. Not reflected in the data, but pertinent from stakeholder discussions, are the impacts of transitions from rural sources in some parts of the watershed to sources related to development as the watershed continues its developmental transition.

The progress made on the implementation activities in the I-Plan suggests the waterway is benefitting from the continuation of the TPDES stormwater permits, good housekeeping for local utility systems, a robust set of public education efforts, and shared benefits from other unrelated local efforts.

Future needs include greater implementation of structural measures to match educational efforts, additional resources (financial and technical) to support implementation, and a focus on mitigating impacts of new development in the western and middle portions of the watershed.

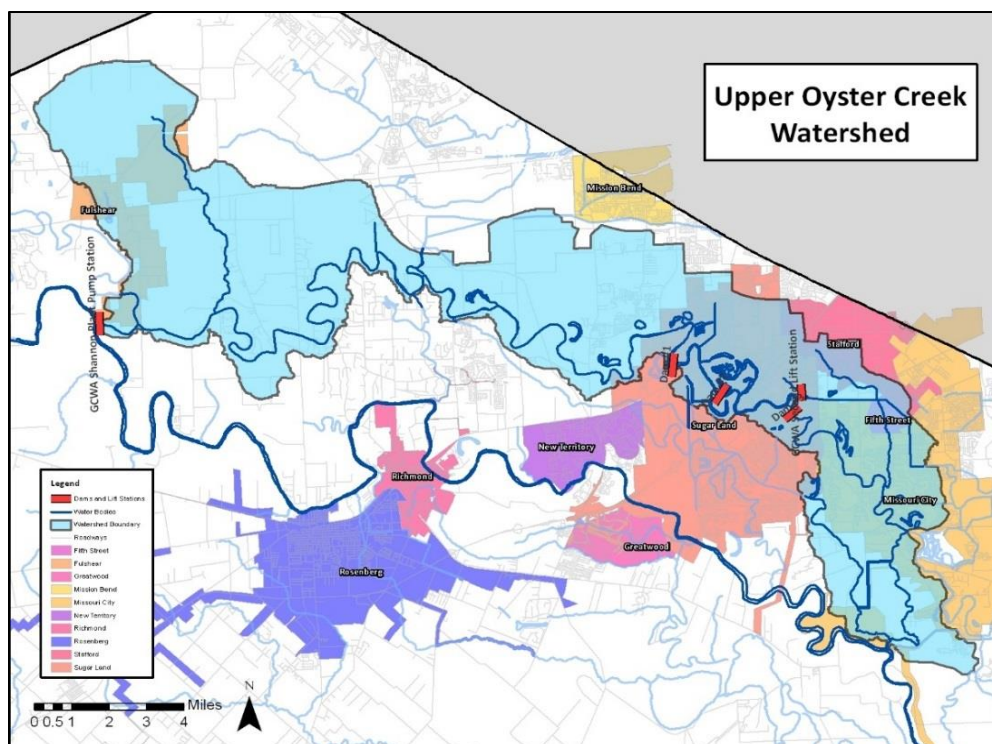


Figure 10. Upper Oyster Creek Watershed

EAST AND WEST FORK OF THE SAN JACINTO RIVER TMDL AND I-PLAN

H-GAC facilitated the E&W coordination committee meeting on July 23, 2019 at the Houston Advanced Research Center in The Woodlands. The committee received a report by H-GAC on BIG implementation efforts, changes to water quality in the BIG project area, highlighted successful projects, and next steps. H-GAC provided an update on new TMDLs in Montgomery County. The committee then considered implementation efforts in the East and West Fork and discussed how to coordinate on future implementation. The I-Plan revision will update figures, tables and content to fully incorporate the inclusion of the E&W, particularly the large area of the East Fork that is managed forest as part of the Sam Houston National Forest. I-Plan Strategy 7 will be revised to include best practices and technical assistance provided by the Texas Forest Service.

JARBO BAYOU TMDL AND I-PLAN

No meetings were held during the fiscal year. TCEQ commissioners adopted the Jarbo Bayou TMDL in January 2018. The stakeholder recommended joining the BIG and implement the BIG I-Plan. The BIG approved addendum #4 to the I-Plan in FY 2018 which joins the Jarbo Bayou watershed to the BIG project area. The 2019 Annual Report reflects these changes. The I-Plan revision will update figures, tables and content to fully incorporate addendum #4. The revision will include changes to the Strategy 6 Illicit Discharges to develop an action to address sources of fecal bacteria from recreational and live aboard boats in Clear Lake.

CHOCOLATE BAYOU DRAFT I-PLAN

The Chocolate Bayou Draft I-Plan was delivered in June. The I-Plan includes a review of the data and steps needed to develop the Chocolate Bayou TMDL. Sources of bacteria were provided and land cover analysis with general source loading estimates, applied to the watershed.

The loading estimates based on land cover allowed for prioritization of best practices and estimated reduction values to be determined. The draft will be presented to watershed stakeholders in FY20 once TCEQ completes their review and the document updated.

CONCLUSIONS

The BIG continues to implement the BIG I-Plan. The top three goals for the BIG are: 1) correcting failing onsite sewage facilities (OSSFs), addressing non-point sources and stormwater management through 2) large-and small stormwater infrastructure projects and 3) identifying and correcting illicit discharges. H-GAC and BIG also provide to the region via grant funding or through individual MS4 stormwater permits, residential fecal bacteria reduction education and outreach, e.g. FOG and pet wastes.

While trends in bacteria continue to demonstrate improved conditions, that improvement has slowed in recent years. The BIG is revising the I-Plan and will look for opportunities to review and reflect on previous efforts, identify intransient implementation actions for revision, and identify new actions to improve future implementation.

In addition to more passive outreach, H-GAC has sought funding for on-the-ground implementation of the BIG I-Plan and other WBPs in the region. These projects include an award program, LID incentives, OSSF improvements, sanitary sewer improvements and local watershed-based planning.

Through these on-the-ground projects, H-GAC is hoping to see greater use of the best practices and to see improved interest and participation in watershed-based planning efforts. As MS4s are increasingly being asked to address impaired waters, H-GAC seeks to demonstrate the connection between watershed-based planning and MS4 permit execution

H-GAC developed the WISE awards to highlight key water quality improvement projects in the region. H-GAC hopes to grow this award program, continue to implement the I-plan measure and see greater interest in expanding the use of water quality improvement projects to address contact recreation impairments.

H-GAC sought to encourage the use of low impact development (LID)/green infrastructure (GI) beyond the LID Guidebook completed in 2016. H-GAC completed in 2019 work that directly evaluated development codes and ordinances and maintenance agreements in the cities of Pearland and Mont Beliveu. H-GAC will continue to look for chances to continue this effort and find other ways to expand and implement LID/GI in the region.

In 2018, H-GAC partnered with Harris County (HC) to utilize water related fines to implement an OSSF SEP, leveraged to the H-GAC/TCEQ SEP OSSF project. H-GAC received over \$100,000 to help correct failing systems. This project assists low-income homeowners in the repair or replacement of their failing OSSFs. Since the program's inception, 23 failed systems have been replaced with new aerobic OSSFs, and an additional 13 OSSFs have been repaired. Should additional funding be received, H-GAC plans to continue in FY20.

H-GAC completed an illicit discharge detection project in 2018 and made those findings available through the BIG website. H-GAC partnered with BPA in 2019 with funding from GBEP to continue this program which demonstrates a rapid assessment and follow-up approach to identify problem areas and focus resources to correct discharges. This project will get underway in FY20.

H-GAC supports regional and local watershed-based planning initiatives. Within the BIG, the West Fork of the San Jacinto River WPP was approved in 2019. H-GAC through TCEQ's 319 program began work on the Cypress WPP. H-GAC also was awarded in FY2019, a 319 grant to begin the Spring WPP in FY20. The WPPs reinforce the TMDL and bacteria reduction measures for implementation.

Houston Area Total Maximum Daily Load Public Participation Project

FY 2019

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