Double Bayou WPP changes in response to EPA Review Comments

EPA reviewed the Double Bayou WPP to check for consistency with the nine-point elements of a successful WPP. They had some helpful comments on how to strengthen the document with regards to these elements, and some changes and additions were made as a result. These changes and additions are outlined below.

General changes: In order to respond to the comments, some of the text in the WPP had slight changes or additions - this means that the Table of Contents and Lists of Figures/Tables had slight changes and page numbers were changed. Also, Texas A&M AgriLife was referred to in two different formats in the draft version; this was changed to Texas A&M AgriLife Extension Service to be consistent throughout. Specific changes and additions are discussed below.

EPA Comment:
We suggest adding a section to this WPP (maybe Water Quality) which specifically explains how TSSWCB/TCEQ/ TRA will identify and address data gaps.

Response: Section 4.1 Data Gaps added as a response to this omission. (Chapter 4, Section 4.1, page 46 – section added as below)

Section added to WPP:

Data gap analysis was conducted to determine the best parameters, locations, schedule and other details for the WPP data and model analysis as well as the Monitoring Plan. Flow data in Double Bayou watershed were very sparse when beginning the project; flow data available from the TCEQ surface water quality monitoring data set for Double Bayou were qualitative rather than quantitative; flow is recorded as "high", "medium" or "low". Quantitative flow measurements had not been collected until the Double Bayou WPP project sampling began. It was determined that quantitative flow data would be collected with every grab sample; these data would be critical for calculating representative flow and load duration curves.

At the beginning of the Double Bayou WPP project, it was determined that spatial representation of sampling data in the watershed was currently heavily biased towards the estuarine and tidal portions of the area. The northern part of the East Fork of Double Bayou was not represented in any of the existing monitoring data. The beginning baseline data set showed that data are collected somewhat intermittently during special studies, or in certain sampling years. It was determined that the data monitoring plan should include efforts to collect data for certain indicator parameters regularly each year. In addition to regular monitoring, rain events in the watershed also need to be a focus; how the watershed responds to major precipitation events indicates the condition of the watershed.

It was also considered important that monitoring stations capture the effects of WWTF effluent along Double Bayou; at the beginning of the Double Bayou WPP there were no direct WWTF monitoring samples. Future monitoring efforts would need to ensure that monitoring stations are located to facilitate collection of this important information. As well, it was determined that information was lacking as to the number and location of septic systems in the watershed.

The Data Gap Analysis resulted in implications for the WPP and implementation monitoring efforts. Using the results from this Data Gap Analysis, the Data Monitoring Plan for the Double Bayou WPP focused on better spatial and temporal coverage than is reflected in the historical data set. Working within the constraints of time and budget factors, the results from the Data Gap Analysis show that sampling efforts needed to place an emphasis on the following:

- Collecting quantitative flow data for use in load durations curves,
- Sampling in non-tidal portions of the Double Bayou watershed,
- Consistently monitoring at regular time intervals each year, and
- Consistently monitoring to capture the effect of heavy rainfall events

Results from the Double Bayou WPP project sampling show that moving forward with the water quality plan for implementation efforts:

- Sampling efforts should still focus on collecting quantitative flow data as it will be a gap in the foreseeable future
- Sampling efforts should still focus on a complete spatial coverage of the watershed
- The WWTF and rainfall events still need to monitored, but focus needs to be more on routine ambient monitoring of the four primary stations."

4 Water Quality

4.1 Data Gaps

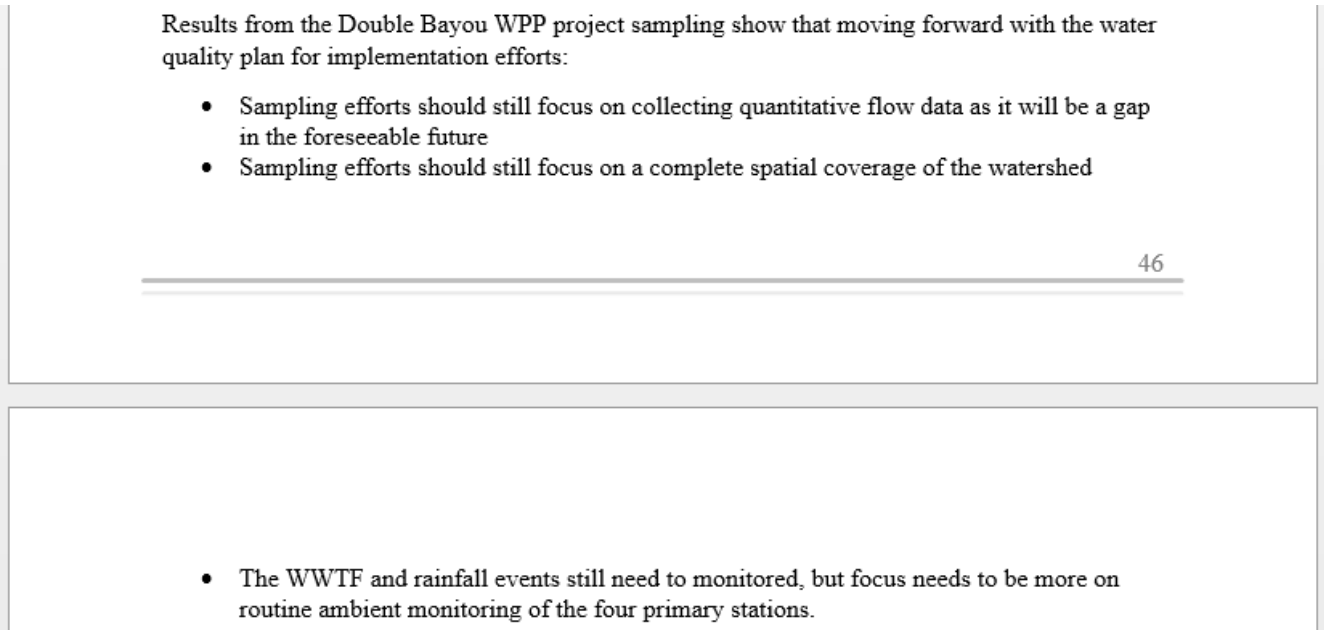
Data gap analysis was conducted to determine the best parameters, locations, schedule and other details for the WPP data and model analysis as well as the Monitoring Plan. Flow data in Double Bayou watershed were very sparse when beginning the project; flow data available from the TCEQ surface water quality monitoring data set for Double Bayou were qualitative rather than quantitative; flow is recorded as "high", "medium" or "low". Quantitative flow measurements had not been collected until the Double Bayou WPP project sampling began. It was determined that quantitative flow data would be collected with every grab sample; these data would be critical for calculating representative flow and load duration curves.

At the beginning of the Double Bayou WPP project, it was determined that spatial representation of sampling data in the watershed was currently heavily biased towards the estuarine and tidal portions of the area. The northern part of the East Fork of Double Bayou was not represented in any of the existing monitoring data. The beginning baseline data set showed that data are collected somewhat intermittently during special studies, or in certain sampling years. It was determined that the data monitoring plan should include efforts to collect data for certain indicator parameters regularly each year. In addition to regular monitoring, rain events in the watershed also need to be a focus; how the watershed responds to major precipitation events indicates the condition of the watershed.

It was also considered important that monitoring stations capture the effects of WWTF effluent along Double Bayou; at the beginning of the Double Bayou WPP there were no direct WWTF monitoring samples. Future monitoring efforts would need to ensure that monitoring stations are located to facilitate collection of this important information. As well, it was determined that information was lacking as to the number and location of septic systems in the watershed.

The Data Gap Analysis resulted in implications for the WPP and implementation monitoring efforts. Using the results from this Data Gap Analysis, the Data Monitoring Plan for the Double Bayou WPP focused on better spatial and temporal coverage than is reflected in the historical data set. Working within the constraints of time and budget factors, the results from the Data Gap Analysis show that sampling efforts needed to place an emphasis on the following:

- Collecting quantitative flow data for use in load durations curves,
- Sampling in non-tidal portions of the Double Bayou watershed,
- Consistently monitoring at regular time intervals each year, and
- Consistently monitoring to capture the effect of heavy rainfall events



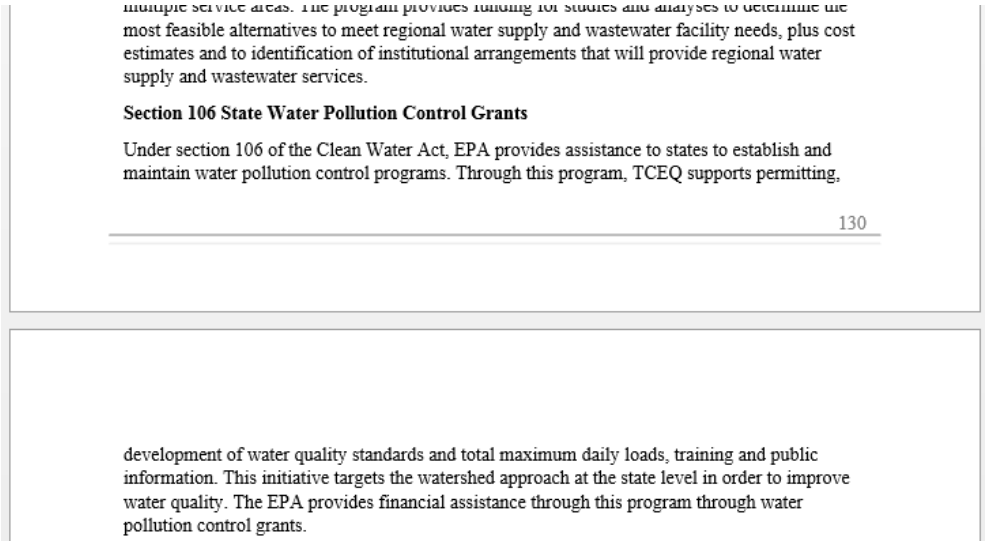
EPA Comment: *CWA Section 106 grant funding is sourced from EPA. There is no mention of EPA in this grant program. Please add language indicating EPA's role in the CWA 106 funding process.*

Response: We apologize for this oversight in the omission of the EPA. Added language in Section 8.11 Sources of Funding to reflect that the CWA Section 106 grant funding is sourced from EPA. (Chapter 8, Section 8.11, page 127, changes made as shown in redline below)

Language changed in WPP as redlined:

"Section 106 State Water Pollution Control Grants

~~The~~ Under s~~S~~ection 106 ~~State Water Pollution Control Grants~~ of the Clean Water Act, EPA provides assistance to states to establish and maintain water pollution control programs. Through this program, TCEQ supports permitting, development of water quality standards and total maximum daily loads, training and public information. This initiative targets the watershed approach at the state level in order to improve water quality. ~~The~~The EPA provides financial assistance through this program ~~is~~ through water pollution control grants. ~~based~~."


multiple service areas. The program provides funding for studies and analyses to determine the most feasible alternatives to meet regional water supply and wastewater facility needs, plus cost estimates and to identification of institutional arrangements that will provide regional water supply and wastewater services.

Section 106 State Water Pollution Control Grants

Under section 106 of the Clean Water Act, EPA provides assistance to states to establish and maintain water pollution control programs. Through this program, TCEQ supports permitting,

130

development of water quality standards and total maximum daily loads, training and public information. This initiative targets the watershed approach at the state level in order to improve water quality. The EPA provides financial assistance through this program through water pollution control grants.

EPA comment: These bacteria load reductions presented in Table 8-3 do not indicate whether they are E. coli or Enterococci. Please add to the Table title or on the Table heading.

Response: The information was added on Table 8-3 in the Table heading. (Chapter 8, Section 8.12 Expected Load Reductions, page 132 - addendum to title added as highlighted below)

Language added to WPP:

"Table 8-3 Expected load reductions

*units for Table 8-3 are in E. coli concentrations, cfu; note, however, the actual load concentration reductions will be measured using the appropriate E. coli or Enterococci cfu depending on location in watershed"

Management Measure	Expected Bacteria Load Reduction*
Wastewater Management Measures	
Collection System Study (*smoke test and video lines*)	1.13×10^{12}
Upgrade Collection System Line and Manhole Replacement	
Lift Station Upgrades (*bypass pumps*)	
Pump Repair and Replacement (*high priority*)	
Septic Systems Management Measures	
Continued Enforcement of Septic System Complaints with Population Growth	7.45×10^{9}
Increase Septic System Review and Inspection Capacity (*including relief lines and laterals*)	
Connect Homes with Septic Systems to Sewer Line (*expand sewer system*)	
Agricultural Nonpoint Source Management Measures	
Water Quality Management Plans (WQMP)	1.66×10^{13}
WQMP Technician (*new position-shared with Cedar Bayou*)	
Wildlife and Non-Domestic Plant/Animal Management Measures	
Physical Removal Days (*aquatic and terrestrial invasive species*)	6.41×10^{12}
Feral Hog Specialist (*existing*)	
Feral Hog Management	
Feral Hog County Position	
Feral Hog Control (*equipment*)	
Feral Hog Bounties (*county*)	

Table 8-3 Expected load reductions

**units for Table 8-3 are in E. coli concentrations, cfu; note, however, the actual load concentration reductions will be measured using the appropriate E. coli or Enterococci cfu depending on location in watershed*

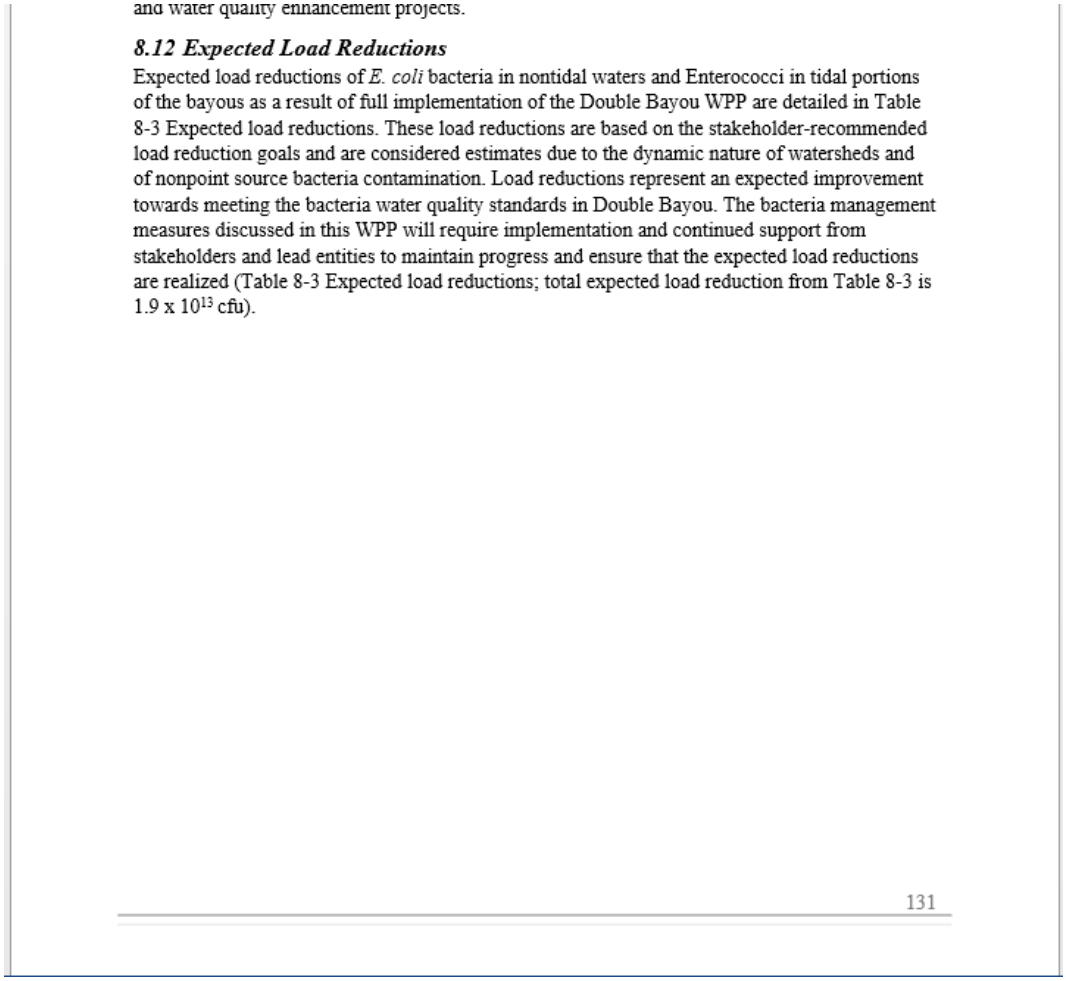
An adaptive management approach will be the focus of the monitoring plan and overall implementation. The goal of this approach is to minimize the potential for minor adjustments to

EPA Comment: Load Reduction values are broken out by individual management measure, and a total for all management measures would be useful.

Response: A total value for all management measures was included as part of the discussion of Table 8-3. (Chapter 8, Section 8.12 Expected Load Reductions, page 131 – changes made as shown in redline below)

Language changed in WPP as redlined:

"Expected load reductions of E. coli bacteria in nontidal waters and Enterococci in tidal portions of the bayous as a result of full implementation of the Double Bayou WPP are detailed in Table 8-3 Expected load reductions. These load reductions are based on the stakeholder-recommended load reduction goals and are considered estimates due to the dynamic nature of watersheds and of nonpoint source bacteria contamination. Load reductions represent an expected improvement towards meeting the bacteria water quality standards in Double Bayou. The bacteria management measures discussed in this WPP will require implementation and continued support from stakeholders and lead entities to maintain progress and ensure that the expected load reductions are realized ("Table 8-3 Expected load reductions; total expected load reduction from Table 8-3 is 1.9 x 10^{13} cfu").



and water quality enhancement projects.

8.12 Expected Load Reductions

Expected load reductions of *E. coli* bacteria in nontidal waters and Enterococci in tidal portions of the bayous as a result of full implementation of the Double Bayou WPP are detailed in Table 8-3 Expected load reductions. These load reductions are based on the stakeholder-recommended load reduction goals and are considered estimates due to the dynamic nature of watersheds and of nonpoint source bacteria contamination. Load reductions represent an expected improvement towards meeting the bacteria water quality standards in Double Bayou. The bacteria management measures discussed in this WPP will require implementation and continued support from stakeholders and lead entities to maintain progress and ensure that the expected load reductions are realized (Table 8-3 Expected load reductions; total expected load reduction from Table 8-3 is 1.9 x 10^{13} cfu).

131

EPA Comment: Does the WPP include progress evaluations and possible "course corrections" as needed? Section 8.12 could contain more explanation of incremental measurement of load reductions through monitoring/analyses schedules.

Response: Language added in Section 8.12 Expected Load Reductions that addresses in more detail the idea behind adaptive management in correlation with monitoring and management measure implementation. (Chapter 8, Section 8.12 Expected Load Reductions, page 133 – paragraph added as below)

Paragraph added to WPP:

"An adaptive management approach will be the focus of the monitoring plan and overall implementation. The goal of this approach is to minimize the potential for minor adjustments to become a larger issue, and to coordinate with stakeholders and other implementation personnel on management measures. Based upon the monitoring results, an adaptive management approach will be implemented, possibly including course corrective actions such as: a) implementing more of the actions in the WQMPs that are proven to be more effective (achieving long-term reduction goals) and documenting the actions that have proven to have regional challenges; b) adopting the feral hog removal techniques that are proving to reduce populations size (achieving long-term reduction goals) or c) re-defined area for septic system replacements and/or maintenance."

development of water quality standards and total maximum daily loads, training and public information. This initiative targets the watershed approach at the state level in order to improve water quality. The EPA provides financial assistance through this program through water pollution control grants.

Supplemental Environmental Projects (SEP)

Supplemental Environmental Projects Program (SEP) are environmentally beneficial projects that may be undertaken as a result of a negotiated agreement with TCEQ to offset a penalty in an enforcement action. SEP funding supports projects for pollution prevention, pollution reduction and water quality enhancement projects.

8.12 Expected Load Reductions

Expected load reductions of *E. coli* bacteria in nontidal waters and Enterococci in tidal portions of the bayous as a result of full implementation of the Double Bayou WPP are detailed in Table 8-3 Expected load reductions. These load reductions are based on the stakeholder-recommended load reduction goals and are considered estimates due to the dynamic nature of watersheds and of nonpoint source bacteria contamination. Load reductions represent an expected improvement towards meeting the bacteria water quality standards in Double Bayou. The bacteria management measures discussed in this WPP will require implementation and continued support from stakeholders and lead entities to maintain progress and ensure that the expected load reductions are realized (Table 8-3 Expected load reductions; total expected load reduction from Table 8-3 is 1.9×10^{13} cfu).

EPA Comment: Language in the Monitoring Plan section could include more detailed explanation of how TSSWCB/HARC will use the monitoring plan/schedule to effectively determine if Water Quality Standards for bacteria are being met. A statement to justify why this plan is adequate for WQS attainment determination would clarify/support this plan.

Response: Language was added in Section 8.13 Monitoring Plan detailing how the monitoring plan would be used to address bacteria and dissolved oxygen in terms of water quality standards and how the plan effectively supports this approach (Chapter 8, Section 8.13 Expected Load Reductions, page 134 – paragraph added as below).

Paragraph added to WPP:

"Monitoring will measure and document any observed changes in water quality constituents and determine whether or not corrective actions are needed as management measures are implemented. Monitoring will be implemented initially for a minimum of two years to clearly identify the nature and extent of possible resource and water quality issues; ideally, monitoring will be continued throughout implementation depending on budgetary constraints. Over time, as management measures are implemented, analysis of monitoring samples will be evaluated to determine percent reduction in bacteria and percent improvement in dissolved oxygen to determine constituent changes based on management measures implemented. The monitoring plan ensures enough bacteria data to calculate geomeans and enough single dissolved oxygen samples as well as a limited series of 24-hour dissolved oxygen assessments – all necessary for evaluations based on water quality standards. As noted in Section 8-12 Expected Load Reductions, if analysis of water quality monitoring shows that predicted load reductions based on implemented management measures are not occurring, corrective actions will be implemented. Adaptive management with course correction based on analysis of monitored water quality data ensures the implementation strategies outlined in this WPP will address water quality standards based on the stakeholder developed reduction goals."

Monitoring will measure and document any observed changes in water quality constituents and determine whether or not corrective actions are needed as management measures are implemented. Monitoring will be implemented initially for a minimum of two years to clearly identify the nature and extent of possible resource and water quality issues; ideally, monitoring will be continued throughout implementation depending on budgetary constraints. Over time, as management measures are implemented, analysis of monitoring samples will be evaluated to determine percent reduction in bacteria and percent improvement in dissolved oxygen to determine constituent changes based on management measures implemented. The monitoring plan ensures enough bacteria data to calculate geomeans and single samples dissolved oxygen samples as well as a limited series of 24-hour dissolved oxygen assessments – all necessary for evaluations based on water quality standards. As noted in Section 8.12 Expected Load Reductions, if analysis of water quality monitoring shows that predicted load reductions based on implemented management measures are not occurring, corrective actions will be implemented. Adaptive management with course correction based on analysis of monitored water quality data ensures the implementation strategies outlined in this WPP will address water quality standards based on the stakeholder developed reduction goals.

8.14 Bacterial Source Tracking

The Double Bayou Watershed Partnership and Work Groups also recommended implementing Bacterial Source Tracking (BST) as a possible management tool for project implementation, if appropriate. BST has evolved greatly as a science over recent years, and advances have been made to refine the technology; even so, separate species profile identification is not always possible. There are currently State bacteria markers in an established BST library (collection of know species or species group profiles) that could help identify and track Double Bayou Watershed bacterial sources. BST could be used to help further refine SELECT results and also adjust implementation efforts, depending on results.