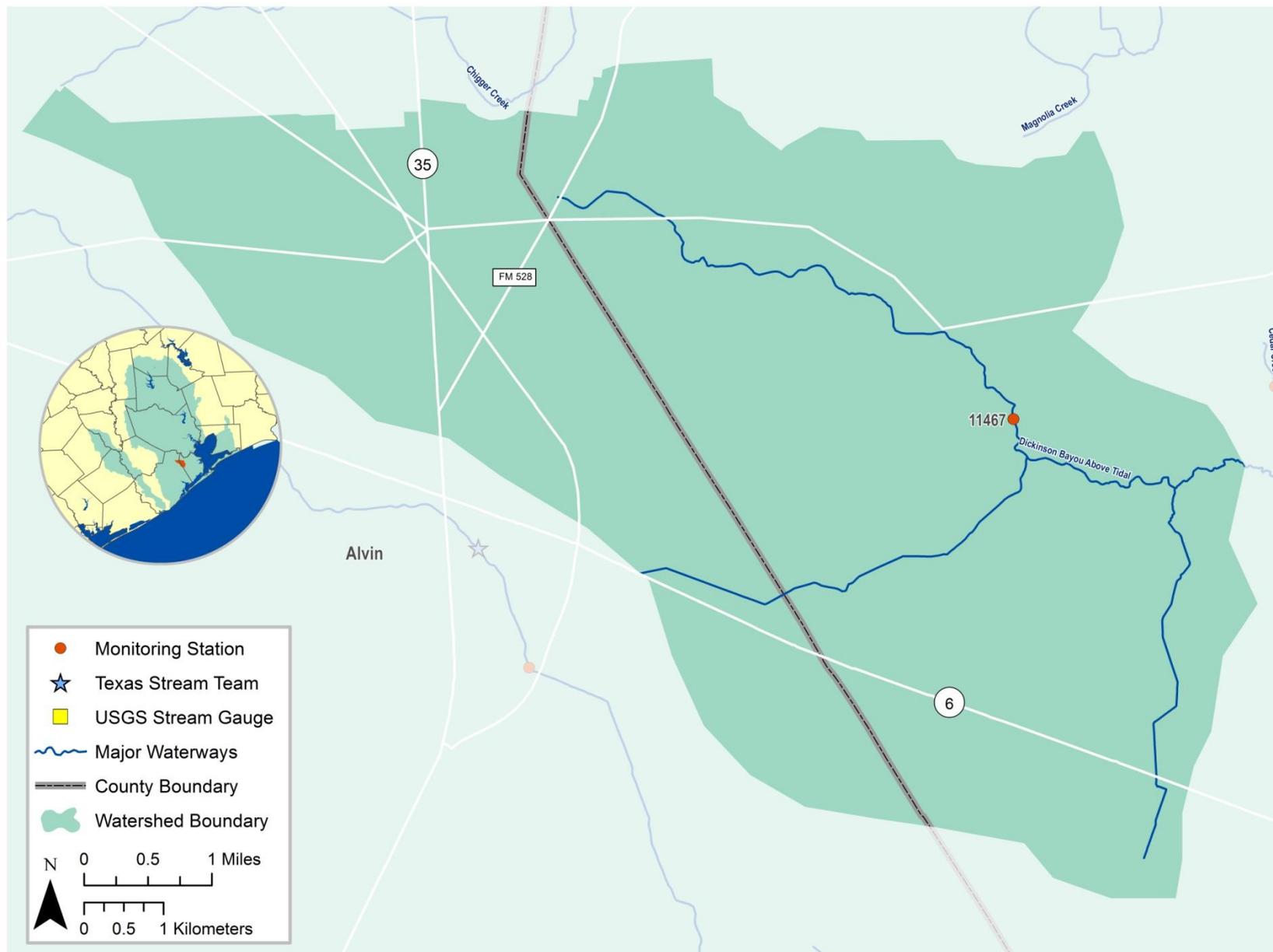
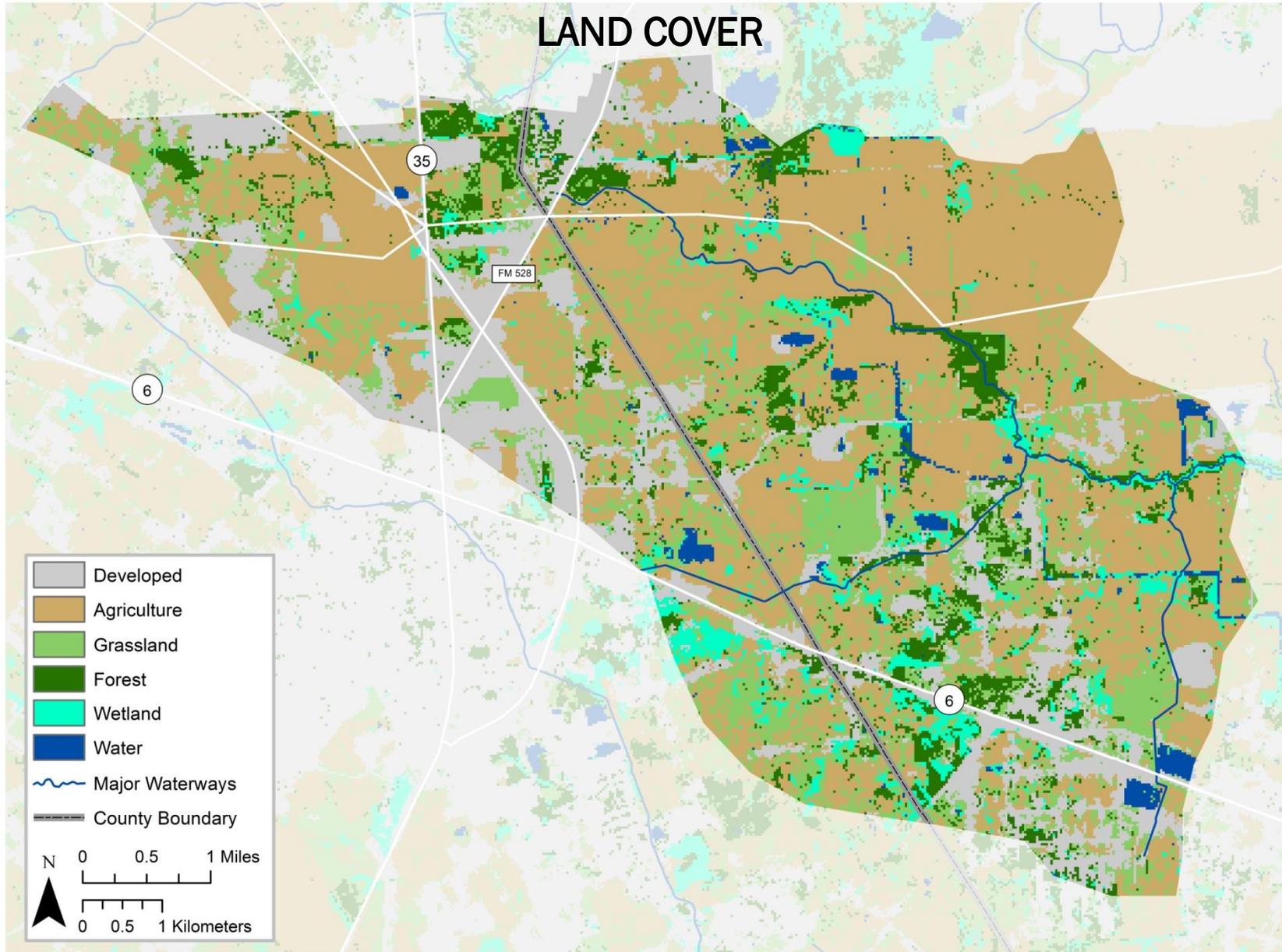
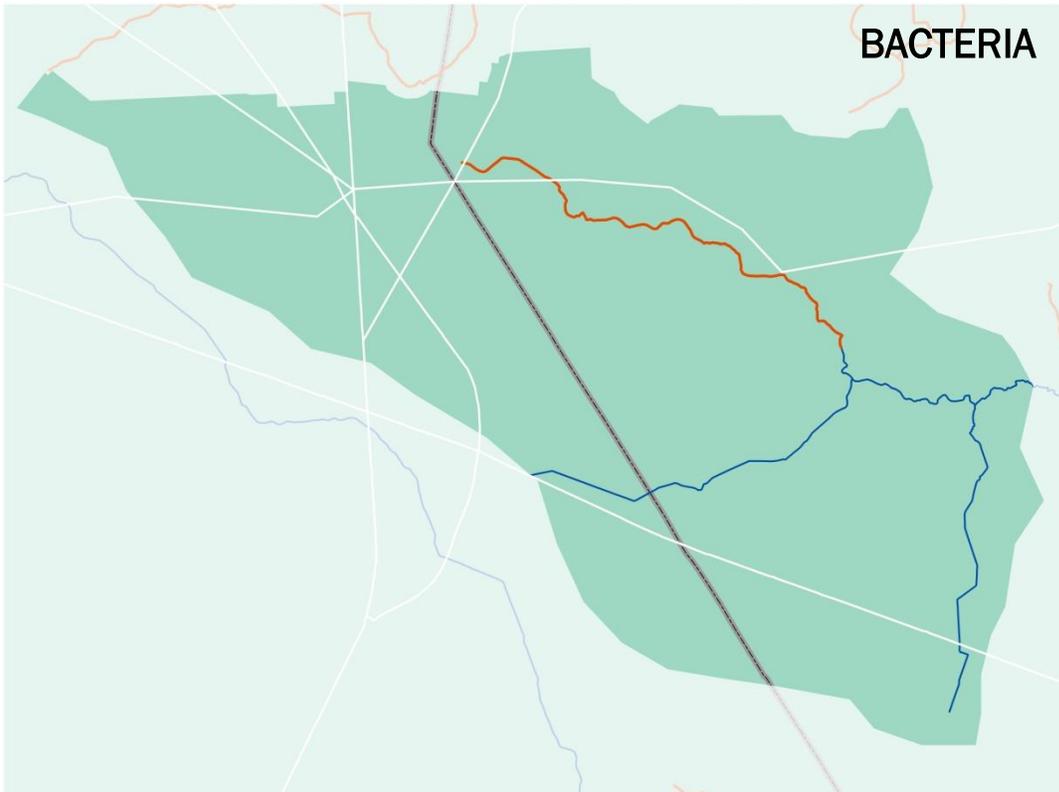


# DICKINSON BAYOU ABOVE TIDAL - SEGMENT 1104



# DICKINSON BAYOU ABOVE TIDAL - SEGMENT 1104 LAND COVER





~~~~~ Impairment    ~~~~~ Concern    ~~~~~ No Impairments or Concerns

|                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                          |                 |                            |                                                         |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-----------------|----------------------------|---------------------------------------------------------|
| <b>Segment Number: 1104</b>                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Name: Dickinson Bayou Above Tidal</b> |                 |                            |                                                         |
| <b>Length:</b>                               | 8 miles                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Watershed Area:</b>                   | 32 square miles | <b>Designated Uses:</b>    | Primary Contact Recreation 1; Intermediate Aquatic Life |
| <b>Number of Active Monitoring Stations:</b> | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Texas Stream Team Monitors:</b>       | 0               | <b>Permitted Outfalls:</b> | 3                                                       |
| <b>Description:</b>                          | <p>Segment 1104 (Perennial Stream w/ intermediate ALU): From a point 4.0 km (2.5 mi) downstream of FM517 in Galveston County to FM 528 in Galveston County</p> <p>Segment 1104A (Perennial Stream w/ high ALU): Unnamed Tributary of Dickinson Bayou Above Tidal (unclassified water body) – From the Dickinson Bayou Above Tidal confluence to State Hwy 6</p> <p>Segment 1104B (Perennial Stream w/ high ALU): Unnamed Tributary of Dickinson Bayou Above Tidal (unclassified water body) – From the Dickinson Bayou Above Tidal confluence to a point 0.46 km (0.73 mi) upstream of State Hwy 6</p> |                                          |                 |                            |                                                         |

| Percent of Stream Impaired or of Concern |             |          |                  |           |               |       |
|------------------------------------------|-------------|----------|------------------|-----------|---------------|-------|
| Segment ID                               | PCBs/Dioxin | Bacteria | Dissolved Oxygen | Nutrients | Chlorophyll a | Other |
| 1104                                     | -           | 72       | 72               | -         | -             | -     |

| Segment 1104                                  |                  |                                   |                  |
|-----------------------------------------------|------------------|-----------------------------------|------------------|
| Standards                                     | Perennial Stream | Screening Levels                  | Perennial Stream |
| Temperature (°C/°F):                          | 32 / 90          | Ammonia (mg/L):                   | 0.33             |
| Dissolved Oxygen (24-Hr Average) (mg/L):      | 5.0 / 4.0        | Nitrate-N (mg/L):                 | 1.95             |
| Dissolved Oxygen (Absolute Minima) (mg/L):    | 3.0 / 3.0        | Orthophosphate Phosphorus (mg/L): | 0.37             |
| pH (standard units):                          | 6.5-9.0          | Total Phosphorus (mg/L):          | 0.69             |
| <i>E. coli</i> (MPN/100 mL) (grab):           | 399              | Chlorophyll a (µg/L):             | 14.1             |
| <i>E. coli</i> (MPN/100 mL) (geometric mean): | 126              |                                   |                  |
| Chloride (mg/L as Cl):                        | 200              |                                   |                  |
| Sulfate (mg/L as SO <sub>4</sub> ):           | 100              |                                   |                  |
| Total Dissolved Solids (mg/L):                | 600              |                                   |                  |

**FY 2016 Active Monitoring Stations**

| Site ID | Site Description          | Frequency | Monitoring Entity | Parameter Groups                                   |
|---------|---------------------------|-----------|-------------------|----------------------------------------------------|
| 11467   | Dickinson Bayou at FM 517 | Quarterly | TCEQ              | Field, Conventional, Bacteria, Chlorophyll a, Flow |

**Water Quality Issues Summary**

| Issue                                        | 2014 Assessment<br><i>I - Impaired<br/>C - Of Concern</i> | Possible Causes / Influences / Concerns Voiced by Stakeholders                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Possible Solutions / Actions To Be Taken                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Elevated Levels of Indicator Bacteria</b> | 1104 I                                                    | <ul style="list-style-type: none"> <li>▪ Animal waste from agricultural production, wildlife ranch, and domestic animal facilities</li> <li>▪ Constructed stormwater controls failing</li> <li>▪ Rapid urbanization and increased impervious cover</li> <li>▪ Developments with malfunctioning OSSFs</li> <li>▪ Improper or no pet waste disposal</li> <li>▪ Poorly operated or undersized WWTFs</li> <li>▪ Waste haulers illegal discharges/improper disposal</li> <li>▪ Direct and dry weather discharges</li> <li>▪ WWTF non-compliance, overflows, and collection system by-passes</li> </ul> | <ul style="list-style-type: none"> <li>▪ Implement stream fencing or alternative water supplies to keep livestock out of or away from waterways</li> <li>▪ Create and implement Water Quality Management Plans for individual agricultural properties</li> <li>▪ Install and/or conserve vegetative buffer areas along all waterways</li> <li>▪ Improve compliance and enforcement of existing stormwater quality permits</li> <li>▪ Improve construction oversight to minimize TSS discharges to waterways</li> <li>▪ Add water quality features to stormwater systems</li> <li>▪ More public education regarding OSSF operation and maintenance</li> <li>▪ Ensure proper citing of new or replacement OSSFs</li> <li>▪ More public education on pet waste disposal</li> <li>▪ Regionalize chronically non-compliant WWTFs</li> <li>▪ Require all systems to develop and implement a utility asset management program and protect against power outages at lift stations</li> <li>▪ Impose new or stricter bacteria limits than currently designated by TCEQ</li> <li>▪ Increase monitoring requirements for self-reporting</li> </ul> |

|                                                                                   |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p style="text-align: center;"><b>Dissolved<br/>Oxygen<br/>Concentrations</b></p> | <p>1104 C</p> | <ul style="list-style-type: none"> <li>▪ Excessive nutrients and organic matter from agricultural production, and related activities</li> <li>▪ Excessive nutrients and organic matter from WWTF effluent, SSOs, malfunctioning OSSFs, illegal disposal of grease trap waste, and biodegradable solid waste (e.g., grass clippings and pet waste)</li> <li>▪ High temperature discharges from industrial WWTFs</li> <li>▪ Vegetative canopy removed</li> </ul> | <ul style="list-style-type: none"> <li>▪ Create and implement Water Quality Management Plans for individual agricultural properties</li> <li>▪ Improve compliance and enforcement of existing stormwater quality permits</li> <li>▪ Install and/or conserve riparian buffer areas along all waterways</li> <li>▪ More stringent OSSF maintenance and education</li> <li>▪ More public education on pet waste disposal</li> <li>▪ More public education regarding disposal of household fats, oils, and grease</li> <li>▪ Regionalize chronically non-compliant WWTFs</li> <li>▪ Improve operation and maintenance of existing WWTF and collection systems</li> </ul> |
|-----------------------------------------------------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Segment Discussion:**

**Watershed Characteristics:** The Dickinson Bayou Above Tidal watershed is not as developed as many of the surrounding watersheds. It includes portions of the cities of Santa Fe, League City, Friendswood, and Alvin. Residential and commercial development has been occurring throughout the watershed along major thoroughfares such as FM528 and Texas Highway 6. The predominant land use in the watershed is agriculture and grassland. The majority of the watershed is on on-site sewage facilities (OSSF). There is a large wildlife ranch located immediately downstream of FM517 on the western and southern shoreline of the bayou.

**Water Quality Issues:** The 2014 Texas Integrated Report (IR) lists the assessment unit 1104\_02 as impaired for contact recreation due to elevated levels of *E. coli*. Assessment unit 1104\_02 is also listed in the 2014 IR for a dissolved oxygen (DO) grab concern for aquatic life use support based on screening levels. Over 13 percent of DO grab samples were below the standard. The segment is not meeting the contact recreation or high aquatic life use designations.

**Special Studies/Projects:** This segment has been included in a bacteria TMDL project and a watershed protection plan (WPP), both of which are facilitated by Texas Agrilife. Additionally, H-GAC has been tasked by the TCEQ to implement a basin-wide plan for addressing bacterial impairments for the San Jacinto-Brazos Coastal Basin which includes this segment of Oyster Creek. Development for the basin-wide TMDL began in September of 2015 and will result in a final Basin 11 Summary Report in September of 2016 that will summarize basin characteristics, water quality impairments, potential bacteria sources, and recommendations for bacterial reduction. Refer to the Public Involvement and Outreach section of the 2016 Basin Summary Report for more information.

**Trends:** Regression of water quality data for the Dickinson Bayou Above Tidal watershed revealed five statistically significant parameter trends including increasing pH and Secchi transparency and decreasing ammonia, total phosphorous (TP), and total suspended solids (TSS). This segment is currently impaired for bacteria and is designated as having a concern for DO.

Regression analysis found no significant changes over time for *E. coli* during the period of record, although the majority of samples collected exceed the state water quality standard of 126 MPN/100 mL. [Moving seven-year bacteria geometric means](#) support this observation with mean *E.coli* levels consistently fluctuating above the standard since 2005. Bacteria geomeans reached their peak in 2012 and have begun to make a slow decline since, but

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there is still a long way to go before concentrations fall within compliance. Regression analysis also showed a relatively [stable trend in DO](#) levels over time with only a few samples falling below the 3.0 mg/L minimum standard since 2000.

### Recommendations

Address concerns found in this segment summary through stakeholder participation.

Continue collecting water quality data to support actions associated with any future watershed protection plan development and possible modeling.

Continue working with Texas AgriLife to help complete the bacteria TMDL and the WPP.