Attoyac Bayou Watershed Partnership Stakeholder Meeting

PRELIMINARY WATER QUALITY MONITORING RESULTS

December 8, 2011
ANRA Environmental Laboratory

- The Angelina & Neches River Authority (ANRA) operates an environmental laboratory accredited by the National Environmental Laboratory Accreditation Program (NELAP) through the Texas Commission on Environmental Quality (TCEQ).

- Samples collected by SFASU are submitted to the ANRA Environmental Laboratory for analysis of the following parameters:
  - Ammonia-Nitrogen
  - Nitrate + Nitrite-Nitrogen
  - Dissolved Ortho-Phosphorus
  - Total Phosphorus
  - Total Suspended Solids (TSS)
  - *E. coli.*
Preliminary Analysis Results

- Laboratory data presented represents results to date for the Attoyac Watershed Protection Plan Project as analyzed by the ANRA Environmental Laboratory.

- One set of data has been submitted to TCEQ’s Surface Water Quality Monitoring Information System (SWQMIS) database.
Surface Water Quality Standards

- Analytical results were compared to TCEQ’s water quality standards to determine if values exceeded criteria.

- Attoyac Bayou (Segment 0612) has established criteria. For unclassified segments, the criteria for 0612 were used.

- The following criteria were used:
  - Ammonia-N: 0.33 mg/L
  - Nitrate+Nitrite-N: 1.95 mg/L
  - Orthophosphorus: 0.37 mg/L
  - Total Phosphorus: 0.69 mg/L
  - *E. coli* (geometric mean): 126 cfu/100 ml
10636 - Attoyac Bayou @ SH 21 E. coli (cfu/100mL) Result

**E. coli Summary**
- Minimum: 13
- Maximum: 2400
- Geometric Mean: 158.9

**Geometric Mean exceeds WQS**

10636 - Attoyac Bayou @ SH 21 E. coli (cfu/100mL) Result

Linear (10636 - Attoyac Bayou @ SH 21 E. coli (cfu/100mL) Result)

\[ y = 0.608x - 24328 \]

\[ R^2 = 0.0173 \]
10636 - Attoyac Bayou @ SH 21 Nutrients (mg/L) Results

- Ammonia-N (mg/L)
- Dis. Orthophosphate-P (mg/L)
- Nitrate-N+Nitrite-N (mg/L)
- T. Phosphorus (mg/L)
$y = -0.2709x + 11298$

$R^2 = 0.0078$

15253 - Attoyac Bayou @ SH 7 E. coli (cfu/100mL) Result

### E. coli Summary

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>14</td>
</tr>
<tr>
<td>Maximum</td>
<td>2400</td>
</tr>
<tr>
<td>Geometric Mean</td>
<td>154.0</td>
</tr>
</tbody>
</table>

Geometric Mean exceeds WQS

**15253 - Attoyac Bayou @ SH 7 E. coli (cfu/100mL) Result**
16076 - Attoyac Bayou @ US 59 E. coli (cfu/100mL) Result

E. coli Summary

- Minimum: 12
- Maximum: 2400
- Geometric Mean: 158.4

Geometric Mean exceeds WQS

\[ y = -1.6459x + 67290 \]

\[ R^2 = 0.1261 \]
16083 - Waffelow Creek @ FM 95 E. coli (cfu/100mL) Result

E. coli Summary

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<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Min</td>
<td>7</td>
</tr>
<tr>
<td>Max</td>
<td>2400</td>
</tr>
<tr>
<td>GM</td>
<td>85.3</td>
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</table>

\[ y = -0.9913x + 40534 \]

\[ R^2 = 0.0661 \]
16083 - Waffelow Creek @ FM 95 Nutrients (mg/L) Results

- **Ammonia-N (mg/L)**
  - Results: 16083 - Waffelow Creek @ FM 95

- **Dis. Orthophosphate-P (mg/L)**
  - Results: 16083 - Waffelow Creek @ FM 95

- **Nitrate-N+Nitrite-N (mg/L)**
  - Results: 16083 - Waffelow Creek @ FM 95

- **T. Phosphorus (mg/L)**
  - Results: 16083 - Waffelow Creek @ FM 95
16084 - Terrapin Creek @ FM 95 E. coli (cfu/100mL) Result

\[ y = 0.0805x - 2891.9 \quad \text{R}^2 = 0.0004 \]

E. coli Summary

| Minimum | 9 |
| Maximum | 2400 |
| Geometric Mean | 175.3 |

Geometric Mean exceeds WQS
16084 - Terrapin Creek @ Nutrients (mg/L) Results

- Ammonia-N (mg/L)
- Orthophosphate-P (mg/L)
- Nitrate-N+Nitrite-N (mg/L)
- T. Phosphorus (mg/L)
$y = 0.2802x - 10895$

$R^2 = 0.004$

**E. coli Summary**

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<tbody>
<tr>
<td>Minimum</td>
<td>10</td>
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<tr>
<td>Maximum</td>
<td>2400</td>
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<tr>
<td>Geometric Mean</td>
<td>218.5</td>
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</table>

Geometric Mean exceeds WQS

20841 - Attoyac Bayou @ FM 138 E. coli (cfu/100mL) Result

Angelina & Neches River Authority
20841 - Attoyac Bayou @ FM 138 Nutrients (mg/L) Results
20842 - Attoyac Bayou @ US 84 E. coli (cfu/100mL) Result

E. coli Summary

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Minimum</td>
<td>1</td>
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<tr>
<td>Maximum</td>
<td>1400</td>
</tr>
<tr>
<td>Geometric Mean</td>
<td>40.3</td>
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</tbody>
</table>

\[
y = 0.2865x - 11463
\]

\[
R^2 = 0.0182
\]

Linear (20842 - Attoyac Bayou @ US 84 E. coli (cfu/100mL) Result)
20842 - Attoyac Bayou @ US 84 Nutrients (mg/L) Results

- Ammonia-N (mg/L) Result
- Orthophosphate-P (mg/L) Result
- Nitrate-N+Nitrite-N (mg/L) Result
- T. Phosphorus (mg/L) Result
20843 - Naconiche Creek @ FM 95 E. coli (cfu/100mL) Result

\[ y = 0.7189x - 28870 \]

\[ R^2 = 0.0498 \]

<table>
<thead>
<tr>
<th>E. coli Summary</th>
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<tbody>
<tr>
<td>Minimum</td>
</tr>
<tr>
<td>Maximum</td>
</tr>
<tr>
<td>Geometric Mean</td>
</tr>
</tbody>
</table>

Geometric Mean exceeds WQS

Delta 20843 - Naconiche Creek @ FM 95 E. coli (cfu/100mL) Result

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Linear (20843 - Naconiche Creek @ FM 95 E. coli (cfu/100mL) Result)

Angelina & Neches River Authority
20843 - Naconiche Creek @ FM 95 Nutrients (mg/L) Results

- Ammonia-N (mg/L) Result
- Orthophosphate-P (mg/L) Result
- Nitrate-N+Nitrite-N (mg/L) Result
- T. Phosphorus (mg/L) Result
20844 - Big Iron Ore Creek @ FM 354 E. coli (cfu/100mL) Result

E. coli Summary

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>Minimum</td>
<td>12</td>
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<tr>
<td>Maximum</td>
<td>3400</td>
</tr>
<tr>
<td>Geometric Mean</td>
<td>334.7</td>
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</tbody>
</table>

Geometric Mean exceeds WQS

$y = -0.0738x + 3589.5$

$R^2 = 0.0002$
20844 - Big Iron Ore Creek @ FM 354 Nutrients (mg/L) Results

- Ammonia-N (mg/L)
- Dis. Orthophosphate-P (mg/L)
- Nitrate-N+Nitrite-N (mg/L)
- T. Phosphorus (mg/L)
$y = 0.282x - 11136$

$R^2 = 0.008$

**E. coli Summary**
- Minimum: 38
- Maximum: 2400
- Geometric Mean: 187.1

Geometric Mean exceeds WQS
20845 - West Creek @ CR 2913 Nutrients (mg/L) Results

- Ammonia-N (mg/L) Result
- Dis. Orthophosphate-P (mg/L) Result
- Nitrate-N+Nitrite-N (mg/L) Result
- T. Phosphorus (mg/L) Result
Interim Guidance for Routine Surface Water Quality Monitoring During Extended Drought

- Document issued by TCEQ to address routine surface water quality monitoring activities during periods of extended drought.

Interim Guidance for Routine Surface Water Quality Monitoring During Extended Drought

• Collect and report data according to the following guidelines:

  – Schedule and travel to monitoring sites as you would normally do to meet routine commitments
    • Not necessary if you can reliably determine that the scheduled monitoring site is dry (record a value of 6 for Flow Severity and Days Since Last Significant Precipitation)

  – Photo document flow conditions, even if the monitoring station is dry

  – If water is present at the stream monitoring sight within ± 400 meters of the established monitoring station, and minimum size meets the required dimensions (see below), go ahead and collect routine monitoring data

    • A pool is defined as anything ≥ 10 meters in length and ≥ 0.4 meters in depth
    • The total length of the reach upstream/downstream of a sample station to determine pool coverage should be between 500 and 800 meters.
    • A physical measurement is the preferred method for determining percent pool coverage, but a visual estimate can also be made.
Interim Guidance for Routine Surface Water Quality Monitoring During Extended Drought

– Report the following pool characteristics:
  • Maximum pool width (meters)
  • Maximum pool depth (meters)
  • Pool length in meters (meters)
  • Percent pool coverage in 500 meter reach

– Report location of where the main pool is in relation to the bridge crossing and any other pertinent details such as presence of fish, mussels, or other wildlife.

– Photographs upstream and downstream of the bridge and of the main pool are encouraged.

– Even when the monitoring site is dry, create a sample event in the TCEQ’s Surface Water Quality Monitoring Information System (SWQMIS) database for field data.
Interim Guidance for Routine Surface Water Quality Monitoring During Extended Drought

- The minimum data required to report is Flow Severity and Days Since Last Significant Precipitation.

- If the stream channel contains water, but there is no flow, report 1 for Flow Severity, and a flow value of 0 cfs.

- If the stream contains no water, report a value of 6 for Flow Severity, and do not report a result for flow.

- Report the actual number of Days Since Last Significant Precipitation, even if the value is greater than 7. The statewide outlier maximum for this parameter has now been set to detect outliers at 75 days.

- Note comments indicating drought condition.
Contact Information

Please direct questions and comments to:

Brian Sims
Environmental Division Manager
Angelina & Neches River Authority
210 Lufkin Avenue
Lufkin, TX 75901

Phone: 936-633-7527
Fax: 936-632-7799
Email: bsims@anra.org
Web: www.anra.org