Carters Creek Watershed Assessment
Project Update

Lucas Gregory
Texas Water Resources Institute
June 1, 2015
### Water Quality Monitoring Sites

Table 1. Carters Creek Watershed Monitoring Sites

<table>
<thead>
<tr>
<th>TCEQ Station #</th>
<th>Site Name/Location</th>
<th>Sampling Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>11785</td>
<td>Carters Creek @ Bird Pond Road</td>
<td>monthly</td>
</tr>
<tr>
<td>11782</td>
<td>Carters Creek @ SH 6 (upstream of Burton Creek confluence)</td>
<td>monthly</td>
</tr>
<tr>
<td>21259</td>
<td>Carters Creek @ William D. Fitch</td>
<td>monthly</td>
</tr>
<tr>
<td>11783</td>
<td>Burton Creek @ SH 6 (downstream of WWTF)</td>
<td>monthly</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TCEQ Station #</th>
<th>Site Name/Location</th>
<th>Sampling Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>11785</td>
<td>Carters Creek @ Bird Pond Road</td>
<td>during storm events</td>
</tr>
<tr>
<td>11783</td>
<td>Burton Creek @ SH 6</td>
<td>during storm events</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TST Station #</th>
<th>Site Name/Location</th>
<th>Sampling Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>80908</td>
<td>Burton Creek @ SH 6 (downstream of WWTF)</td>
<td>monthly</td>
</tr>
<tr>
<td>80909</td>
<td>Carters Creek @ Briarcrest Dr.</td>
<td>monthly</td>
</tr>
<tr>
<td>80910</td>
<td>Unnamed tributary of Burton Creek @ Maloney Ave.</td>
<td>monthly</td>
</tr>
<tr>
<td>80911</td>
<td>Bee Creek @ Appomattox Dr.</td>
<td>monthly</td>
</tr>
<tr>
<td>80912</td>
<td>Burton Creek 65 m downstream of Tanglewood Dr.</td>
<td>monthly</td>
</tr>
<tr>
<td>80913</td>
<td>Carters Creek below CCWWTF outfall</td>
<td>monthly</td>
</tr>
<tr>
<td>80914</td>
<td>Wolfpen Creek @ Raintree Park</td>
<td>monthly</td>
</tr>
<tr>
<td>80915</td>
<td>Briar Creek @ Hwy 6</td>
<td>monthly</td>
</tr>
<tr>
<td>80916</td>
<td>Carters Creek above CCWWTF outfall</td>
<td>monthly</td>
</tr>
<tr>
<td>80917</td>
<td>Hudson Creek @ SH 30/Harvey Rd.</td>
<td>monthly</td>
</tr>
</tbody>
</table>
Upstream to Downstream

Carter Creek Watershed E. coli Summary: Upstream to Downstream
E. coli Trend
Carters Creek *E. coli* Trend

Carters Creek *E. coli* Summary: Upstream to Downstream

- Station ID: 80909, 11782, 80916, 80913, 11785, 21259
- E. coli (cfu/100mL)

Flow Direction

- 126.0
Carters Creek Differences

<table>
<thead>
<tr>
<th>Station ID</th>
<th>80909 (A)</th>
<th>11782 (B)</th>
<th>80916 (C)</th>
<th>80913 (D)</th>
<th>11785 (E)</th>
<th>21259 (F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geomean</td>
<td>168.85</td>
<td>151.69</td>
<td>422.29</td>
<td>494.94</td>
<td>480.90</td>
<td>373.10</td>
</tr>
<tr>
<td>Median</td>
<td>185.85</td>
<td>118</td>
<td>472.05</td>
<td>866</td>
<td>625</td>
<td>470</td>
</tr>
<tr>
<td>Minimum</td>
<td>15.8</td>
<td>16</td>
<td>179</td>
<td>82</td>
<td>253</td>
<td>100</td>
</tr>
<tr>
<td>Maximum</td>
<td>1986.3</td>
<td>7400</td>
<td>2420</td>
<td>2420</td>
<td>2300</td>
<td>1900</td>
</tr>
<tr>
<td>Statistically Different Stations</td>
<td>C, D, E</td>
<td>C, D, E, F</td>
<td>A, B, D</td>
<td>A, B, C, E, F</td>
<td>A, B, C, F</td>
<td>B, D, E</td>
</tr>
</tbody>
</table>
Load Duration Curves

Burton Creek at SH 6: Station 11783

E. coli Load (cfu/day)

Percent of Days Load Exceeded

n = 25

- High Flows
- Moist Conditions
- Low Flows
- TMDL (cfu/day)
- Mid-Range
- LoadEst (cfu/day)
- Dry Conditions
Load Duration Curves

Carter Creek at Bird Pond Road: Station 11785

E. coli Load (cfu/day) vs. Percent of Days Load Exceeded

- High Flows
- Moist Conditions
- Mid-Range
- Low Flows
- TMDL (cfu/day)
- LoadEst (cfu/day)
- Dry Conditions
Load Duration Curves

Carters Creek at SH 40: Station 21259

- TMDL (cfu/day)
- LoadEst (cfu/day)
- High Flow
- Moist Conditions
- Mid-Range
- Dry Conditions
- Low Flows
Survey Findings Thus Far
Overall Findings

• Upstream sites do have significantly lower median *E. coli* levels than downstream sites
• All sites have high *E. coli* during runoff events
• No excessively high location or locations
• No obvious major sources of *E. coli* identified
Project Extension

• Original end date was August 31, 2015
• Extended project to February 28, 2016
  • Had some cost savings throughout the project
  • No clear cut findings thru project to date
  • Opportunity to apply some different techniques to hopefully learn more
    • Will apply more intensive techniques
    • Pair on the ground observations with water quality data
• Draft Project Report delayed until Fall 2015
  • Will incorporate intensive data collection
Carters Creek Watershed
Intensive Sampling
Tributary Monitoring

**Type and Frequency**
- 67 total sites
- Single sample at each location during a single sampling event
- All samples for a tributary collected on the same day during normal flow conditions
- 1 sampling event per tributary

**Data Collected**
- Field Data
  - Temperature
  - pH
  - DO
  - Specific Conductance
- Lab Data
  - *E. coli* (1603 Method)
Tributary Monitoring Assessment

- Identify rapid increases in *E. coli* counts from Tributary Monitoring results
- Makes use of watershed surveys and GIS analysis to identify and make note of potential sources of *E. coli*
Investigative sampling

**Type and Frequency**
- Locations to be determined by Tributary Monitoring assessment
- Higher resolution sampling of reaches with observed *E. coli* spikes
- Walk the stream while collecting samples

**Data Collected**
- Field Data
  - Temperature
  - pH
  - DO
  - Specific conductance
  - GPS location of sampling site
- Lab Data
  - *E. coli* (1603 Method)
Use of information

• Will hopefully identify sources of *E. coli* that can be addressed relatively easily

• Data to be sent to you to use in your respective jurisdictions

• Data **will not** be utilized by TCEQ for future water body assessment purposes
Intensive Sampling Timeline

• Currently getting paperwork squared away
• 1\textsuperscript{st} round of sampling: mid June
• Data review and plan 2\textsuperscript{nd} sampling: mid June to July 1
• 2\textsuperscript{nd} sampling: early July
• Report writing: mid July to mid August
Questions?