Attending Organizations:
- AEComm
- BRA
- City of Bryan
- City of College Station
- NRCS
- TAMU-BAEN
- TCEQ
- TDA
- Texas A&M AgrLife
- TIAER
- TSSWCB
- TWRI
- TxDOT

2:45 – Introductions: Lucas Gregory TWRI – Acting Project Coordinator

Speakers:
Russell Kotara, Roger Miranda – TCEQ
Larry Hauck – TIAER
Lucas Gregory - TWRI

Gregory gave overview of project, covering components of project leadership and which agencies were in charge of various portions of the project. Explained:
- Why Carters and Burton were on the list of impaired
- That the *E. coli* strain used as the indicator species is not necessarily pathogenic

Watershed
- gave brief overview of watersheds in general, and the Carters and Burton Creek watershed
- Brief overview of hydrologic process (emphasis on infiltration rate and runoff, how human influence affects water quality)

Water Quality
- Covered CWA and the goals of the act, as well as EPA’s role
- Key criteria for determining protection of water body based on its associated beneficial use
- For contact recreation, a bacteria standard is used –indicator species bacteria, *E. coli*
- Long-term geometric mean of 126 colony-forming units per 100 mL water (CFUs/100 mL)
- Individual sample max of 394 CFUs/100 mL no more than 25% of the time
- If present in high concentrations, greater chances of ingesting pathogenic species such as *Giardia, Salmonella, Cryptosporidium, E. coli 0157 h7*

*E. coli* sources
- Explained how *E. coli* ends up in water – comes from all warm-blooded creatures
  - Direct deposition by animals into creek
  - Point sources (dumping, improperly treated waste, waste water treatment facilities, regulated storm water runoff)
  - Non-point (failing septic systems, land-applied waste, non-regulated storm water runoff)

*Texas Water Quality Inventory and 303(d) List*
- Carters since 1999, Burton since 2006
- Carters and Burton not alone – approximately 400 other water bodies in Texas currently on list for bacteria impairments
- 2008 list approved in July 2008
  - 837 individual water body impairments
48% of impairments are due to bacteria
Used data collected over 7 years – December 1999 – November 2006
- 2010 List is currently under review

Questions –
- Q: Local Landowner: What qualifies as “pathogenic?” Growths under skin on pets/livestock with access to water – from bacteria?
- A: Lucas Gregory, TWRI: pathogenic means disease causing. Growth on pets and livestock would have to be biopsied by a veterinarian to determine what the cause is; only then could you speculate about the cause of the growth.

3:00 – Russell Kotara, Roger Miranda - TCEQ – TMDL process overview

Kotara showed the location of the Carters/Burton watershed and gave an overview of land cover and geometric means of both – 831 and 434 CFUs/100 mL, respectively. Also explained that even with revision of standard up to 206 CFUs/100 mL, both streams will still be classified as impaired. Explained how TMDL process works
- TMDL plan based on allowable pollutant loads for use, expressed in volume per day that can enter the water body while still maintaining the 126 CFUs/100 mL standard
- Implementation plan details what should be done to improve water quality – led by stakeholders
- TCEQ must approve both, but EPA only has to approve the TMDL document, not the implementation plan
- Showed how TMDL allocation formula is set up and what the components are (regulated and non-regulated sources)

What are the sources and how will they be mitigated?
- Regulated
  - Wastewater Treatment plants
  - Urban/suburban stormwater (TPDES MS4 Permits)
- Non-regulated
  - To be largely determined and controlled by stakeholders
  - Non-Point source pollutants

Some action already being taken to improve water quality – “Brazos Clean Water”
- Formed by Brazos County, TxDOT, and Texas A&M
- Could use corrective measures already instituted under this plan in the implementation plan

3:14 – Roger Miranda

Project started in 2008 – the State’s water quality standards review has slowed progress
Technical support document developed by TIAER – includes load duration curves (LDCs), SWAT modeling for flow, etc
Currently working on creating final TMDL document and establishing simulated capacity
TCEQ has new approach for developing TMDLs and TMDL Implementation Plans – working on implementation plan while instituting corrective actions
- Draft TMDL document by the end of the summer
- Draft implementation plan by August 2011
- May take 6 or 8 months to approve TMDL document through both TCEQ and EPA, possibly faster for implementation plan as only TCEQ reviews and approves implementation plan

Questions:
- **Q: Richard Eyster, TDA:** Public involvement – claim project started in 2008, has anyone heard about this until now in the rural community? Which stakeholders have been involved?
  - **A: Roger Miranda, TCEQ:** Several meetings have been held: January 29, 2008 and April 22, 2008 the status of the project was presented. The purpose of these meetings was to show initial results of A&M and TIAER studies in the Carters Creek watershed and to dialogue on an approach to begin the public participation process. October 9, 2008 a general public meeting was held to update the public on the status of the project. Several smaller meetings to engage city and county, waste water treatment facilities (WWTFs) and storm water personnel occurred in late 2009 and early 2010, and a meeting with Brazos County SWCD occurred two weeks ago.

- **Q: Richard Eyster, TDA:** Wastewater sampling – has any been done? What about sampling from the actual outfall instead of the end of the treatment system?
  - **A: Roger Miranda, TCEQ:** Self-reporting is done, per issued permit requirements, no additional or special monitoring was done.

- **Q: Aaron Wendt, TSSWCB:** Text below Geometric means on Slide 3 – “discharges to 303(d) listed waters cannot contribute to the impairment” what does that mean?
  - **A: Roger Miranda, TCEQ:** Means that the WWTFs cannot discharge over 126 CFUs/100 mL, at that point, their effluent would not be meeting contact recreation standard. WWTFs can actually dilute the geometric mean if they discharge at a lower CFUs/100 mL count.

- **Q: Richard Eyster, TDA:** Regrowth at discharge pipe outlets even after contact with chlorine when exiting the plant – results in effluent being over 126 limit at outlet. Is this a problem in this watershed?
  - **A: Roger Miranda, TCEQ:** Recent changes and permitting will require all WWTFs to self-report E. coli each month.

- **Q: Richard Eyster, TDA:** What about Thompson’s/Bee/Lick/Wolf Pen/other tributary creeks? Are they monitored? Is the data available? Were these creeks monitored in this project? Or another?
  - **A: Roger Miranda, TCEQ:** Thomspons no, but Bee/Wolf Pen and a few others are. Need to make a data request. Only main arms of Carters/Burton have been station sampled – no tributaries further up have been sampled
  - **A: Karl Goldapp, City of College Station:** Self reporting – larger plants daily, smaller plants once weekly – subject to unannounced, at-random checks to verify numbers that were submitted.
  - **Carter Creek** – intermittent stream with a dry creek bed for most of the summer.

3:35 – Larry Hauck – Background on Carters/Burton

Burton is 100% urban, Carters is about 50/50
4 sampling sites operated by TCEQ or BRA (showed station locations that are most frequently sampled; see map in meeting presentations)

Showed list of permitted facilities with discharges in MGD

Changes in Proposed Contact Recreation use Limits (geometric means)
- Primary contact – 206 (high risk of water ingestion, swimming, wading by children)
- Secondary 1 – 630 (wading, fishing)
- Secondary 2 – 1030 (infrequent use due to lack of access, etc)
- Non-contact - 2060

TMDL Allocation Process – is the final step of TMDL doc before implementation plan is started (formula from earlier – mention of 5% margins of safety for factors)

Load Duration Curve Method (LDC) – uses 20-year period for model to predict daily streamflow records
- Did not have USGS streamflow gauge – used SWAT model to simulate flows
- Could not simulate using nearby gauges – all nearby were in rural areas, so could not use this method as this watershed was too dissimilar

Explained use of derived flow duration curve graphs – how much of the flow is from WWTFs? Effluent-dominated stream, so low flow periods are almost exclusively WWTF flows
- Convert levels from FDC to LDC units
- Laboratory E. coli concentrations are multiplied by simulated flows for use in the LDC
- values above line – over 126, below – under 126
- Almost all events occurred above line = exceeded water quality standard
- Related results to rainfall (1/10 inch of rainfall was threshold)
  - Rainfall days usually relate to high loading rates
  - Outliers on low flow days – possibly long dry spells ended by a light rain?

Difference between blue line and TMDL lines (red and black) – amount to be allocated in TMDL process

Preliminary results
Green dots – geometric means for data – to get a rough idea of what percent reduction may be needed to get down to limit criteria

Showed tables outlining reductions necessary for both Carters and Burton under Very High, High, and low flow events – high flow events would be used for planning to improve water quality
- Take the highest flow regime, and allocate the loads based on those flow rates

For Burton:
- 97% reduction would be needed to reach contact recreation standard (126 CFUs/100 mL) under “Very High” flow regime.
- 96% reduction needed under “Very High” flow regime if new standard of 206 CFUs/100 mL is adopted
- Under “High” flows, no reduction would be needed under proposed regulations

Q: Aaron Wendt, TSSWCB: Generally, we’ll be using the “Very High” flows category? So generally, we’ll be using that geometric mean too? So how did you determine the amount of load reductions in that particular flow regime, did you only look at data in that regime? How many data points? How many does TCEQ require? So was additional data collected?

A: Larry Hauck, TIAER: As far as the load allocation goes, yes. No, this brings up a very important disconnect. Loads will be applied to “Very High” flow regime, but still will be looking at the data over the entire range, so the geometric mean will be considering all the data. I think your point is that it’s based
on sparse data, it’s really just to give a sense of what’s going on.*TMDL will not be written in terms of percent reduction, but in terms of load reductions. TCEQ is moving towards having the sampling done under the implementation plan.

For Carters: Similarly high percent reductions necessary as what was seen in Burton
- The data for these two creeks will be what is used to formulate the TMDL load allocations

Questions:
- Q: Aaron Wendt, TSSWCB: Do we know specific land use percentages?
  - A: Larry Hauck, TIAER: Yes but I do not know the numbers off the top of my head, in total it is about 50% urban and 50% rural
- Q: Richard Eyster, TDA: How much flow coming from permitted WWTFs?
  - A: Larry Hauck, TIAER: Referred back to presentation for permitted flows. “Smoking Gun” not yet identified – will mostly be left to determine by the stakeholders along with additional requirements. TCEQ has no plans to impose additional requirements.
- Q: Richard Eyster, TDA: Where are MS4 outfalls?
  - A: Larry Hauck, TIAER: Not yet determined at this time – it’s a work in progress; no map has been made yet

For regulated and non-regulated stormwater – use an adaptive process; start with recommendations from stakeholders that will be most effective and cost-efficient in reducing bacterial loads. Give these recommended processes time to be implemented, track progress over time, and iterate continually until goal is reached.

Questions:
- Q: Unknown Stakeholder: Bacteria from storm events – could concentrations in storm drains be a contributing factor? Why wouldn’t water from a storm event dilute the concentrations?
  - A: Larry Hauck, TIAER: Storm events flush material from the surface that contains high levels of bacteria (analogy: it’s like taking a bath – high water flows wash off all the excess material).
- Q: Aaron Wendt, TSSWCB: Has modeling been done to pinpoint bacterial sources, BST studies?
  - A: Russell Kotara, TCEQ: Not yet, this can be conducted as a parallel effort during the implementation process if stakeholders feel it is important, increased burden for implementation plan to get into those specifics.
- Q: Aaron Wendt, TSSWCB: What computer model was used for generating 20 yrs of flow data?
  - A: Larry Hauck, TIAER: SWAT

4:14 Wrap-up – Lots of fingers pointed towards Implementation Plan, so where do we go from here?
Lucas Gregory

Covered components of implementation plan
- Holistic plan of how water resources will be managed within the watershed and how bacteria levels will be reduced
- Developed by talking to local residents
- See if they’d like to see more meetings to get public involvement or specialized discussion groups
- Compile data and ideas into focus group areas, and finally into draft implementation plan

Meeting times?
- Organization/institutional – better for daytime
- Industry/local citizens – evenings
- Need to structure meeting times around who will be most likely to attend based on content

Meeting structure – what should be happening at these meetings, what format? Committees and interest groups need to be formed, or do we need more of a general consensus format?