TRIBUTARIES
TECHNICAL MEETING-LOWER ST. JOHNS RIVER

Meeting Summary

Thursday, November 12, 2009
8:00 AM – 4:00 PM

City of Jacksonville- Jake Godbold Building - City Hall Annex
407 North Laura St., Fourth Floor Conference Room
Jacksonville, Florida 32202

Participants

Dave Briglio, MACTEC	Justin Levine, COJ EQD
Tiffany Busby, Wildwood Consulting	Marty Martirone, Jacksonville Beach
Ed Cordova, JEA	Shannon McQuaig, USF
Barry Cotter, COJ EQD	Dana Morton, COJ EQD
Betsy Deuerling, COJ EQD	Jeremy Parrish, FDEP
Scott Dombrosky, NS Mayport	Marcy Policastro, Wildwood Consulting
Ty Edwards, City of Jacksonville Beach	Vince Seibold, COJ
Janet Hearn, ATM	Amy Tracy, FDEP
Donna Kaluzniak, City of Atlantic Beach	Scott Turner, DCHD
Jay Kamys, St. Johns County	Cheryl Wapnick, PBS&J
Phyl Kimball, Kimball Environmental Inc.	Eric Wilson, PBS&J
Karen Kohoutek-Luckin, FDOT	

Meeting purpose: Review results of the LSJR Fecal Coliform Source Identification for 10 project WBIDs that have received microbial source tracking (MST) assessment in 2009. The project WBIDs include: Long Branch (2233), Hogan Creek (2252), McCoy Creek (2257), Big Fishweir Creek (2280), Williamson Creek (2316), Red Bay Branch (2254), Miller Creek (2287), Craig Creek (2297), Miramar Creek (2304), and Christopher Branch (2321).

Action Items:

1. Send updated Sherman and Hopkins Creek boundaries to the Beaches and Mayport. (**Amy Tracy**)
2. Call Dana about information to modify several other WBID boundaries. (**Amy Tracy**)
3. Talk with the FDEP monitoring section about the bacteria standard. (**Amy Tracy**)
4. Check the TMDL rule for TMDLs that may have accidentally been included but that EPA is working on revising. (**Amy Tracy**)
5. Check to see if any research has been done to assess bacteria levels in sediment in *unimpaired* waterbodies (question from Ed Cordova). (**Staff**)
6. Send information to Scott Dombrosky on Department of Health voluntary inspection and maintenance guidelines for residential septic systems. (**Tiffany Busby/Amy Tracy**)

Welcome and Introductions (*Tiffany Busby*)

Tiffany Busby welcomed everyone and thanked the City of Jacksonville (COJ) for hosting the meeting. The purpose of the meeting is to review the extensive work performed by the Tributaries Assessment Team (TAT) over the last year on several priority waterbody identification numbers (WBIDs). PBS&J was contracted to lead this effort and they will provide a WBID by WBID description of the results of the assessment. The participants introduced themselves and the entity they represent.

Amy Tracy congratulated the TAT on winning a Coastal America Award. Tiffany explained that the awards are designed to recognize those people that are implementing coastal projects. This

award was for projects being implemented at the stakeholder level and this is a national recognition. Amy stated that the Florida Department of Environmental Protection (FDEP), COJ, and Duval County Health Department (DCHD) are working on press releases about the award and she has not heard if JEA will also prepare one. Cheryl Wapnick stated that PBS&J is also preparing a press release. Amy will provide more information about the award ceremony once she hears something. This project is one that FDEP hopes other communities will embrace to help identify sources and allow the stakeholders to work together.

Project Approach Overview (*Cheryl Wapnick*)

Cheryl explained that the project used a "weight of evidence approach" that includes multiple steps to obtain information. The first step was a preliminary field reconnaissance, which was conducted by PBS&J and the University of South Florida (USF) to look at field conditions and identify any obvious fecal coliform sources in the project WBIDs. The next step was an analysis of existing data to determine whether areas had chronic or episodic sources, fecal coliform trends over time, and any correlations for fecal coliform with other parameters. A "maps on the table" workshop was then held to present the information that had been found and to ask stakeholders to provide local information, which was added to the maps. The "Walk the WBIDs" field reconnaissance exercise was held over two weeks and involved representatives from each stakeholder walking large portions of each basin. This effort provided a better understanding of each watershed, determined several sources, and identified locations for sampling. The next step was the sampling, which lasted eight months and included microbial source tracking (MST) to help identify the source of the bacteria contamination. Thermal imaging was also conducted during this time in four of the project WBIDs. Throughout the process, there were continuous updates and investigations with the stakeholders.

The sampling plan included fixed stations, which were sampled monthly for the full eight months. Each WBID had three fixed stations to capture the upstream, midstream, and downstream portions of the creeks. These sites are where the MST and sediment sampling started. In addition, flexible stations were sampled in each basin by the TAT. The flexible stations were moved to help target potential sources based on the water quality results. The fixed sites were sampled by PBS&J and USF and the samples were analyzed by USF and Source Molecular. Two of the fixed stations were sampled by FDEP since they were in unsafe locations. The samples from the flexible stations were analyzed by TAT laboratories. The TAT also periodically collected water or sediment samples for analysis by USF and Source Molecular.

The thermal imaging took place on the evening of February 6, 2009, with pre- and post-flight samples collected by the TAT on February 6th and 7th. The four WBIDs that were flown for the thermal imaging were Big Fishweir Creek, Miramar Creek, Craig Creek, and McCoy Creek. PBS&J field verified the thermal anomalies for all of the WBIDs except McCoy Creek, which had the lowest fecal coliform counts. COJ will investigate the anomalies in this WBID.

Science Behind the Approach (*Shannon McQuaig*)

Shannon McQuaig stated that the need to monitor water quality was recognized in the early 1900s. Since it is too difficult to monitor for all pathogens, the use of indicator organisms (IOs) was employed. IOs are usually non-pathogenic and predictive of human pathogens. The IO suite used in the project included fecal coliforms, *Escherichia coli*, and enterococci (more salt tolerant than the other bacteria). In order to measure the amount of the organism in a water sample, the water is filtered through a membrane and colonies are allowed to grow on the membrane. A count of the colony forming units can then be obtained. There are several issues

with using IOs including their potential for regrowth outside of host and the fact that the source of the bacteria cannot be determined. Knowing the source of the bacteria allows for a more accurate risk assessment and helps to remediate pollution. The need to identify the source of the bacteria led to MST, which is based on the fact that certain species or types are associated with the gastrointestinal tract of specific hosts. For this project, USF focused on library-independent MST methods. These methods detect one gene or marker found in the microorganism associated with a specific host.

One method is polymerase chain reaction (PCR), which copies a specific region on a deoxyribonucleic acid (DNA) strand. Creating multiple copies allows the marker to show up better on the gel to determine if there is positive or negative reaction for the marker. Quantitative PCR (qPCR) is used to quantify the amount of the marker instead of looking for a positive or negative presence. This process cleaves the DNA molecule to release fluorescence. The change in the fluorescence is measured and compared against a standard curve to quantify the amount of the marker present in a sample.

There were several markers used in the study. The ruminant-associated *Bacteroidales* marker indicates if there are cattle, goat, sheep, or deer present. There is also a horse marker, the horse-associated *Bacteroidales*. Three human markers were used. One is the human polyomavirus (HPyVs), which is excreted in urine and found in relatively high concentrations in sewage. Most people are infected with this virus early in life but it is not harmful. Because this is a virus, it is a lot smaller than the bacteria markers and can travel further. The *esp* marker was processed by Source Molecular. A ratio is determined between total enterococci and those with the *esp* gene and this ratio is related to the level of human contamination. The *esp* gene is only excreted in small portion of the population and *esp* is less robust in the environment than the other human markers so it does not always make it through septic tank systems. The third human marker is human-associated *Bacteroidales* (H-Bac), which was analyzed by Source Molecular through qPCR. Having three human markers is helpful because each has a different survival rate in the environment, multiple markers increases predictive power, and more certainty helps to target remedial actions.

Donna Kaluzniak asked if a similar assessment will be conducted for Sherman Creek and Hopkins Creek. Tiffany responded that funding is not available to continue intensive assessment efforts in additional WBIDs. The Beaches can implement some or all of these components to assess their WBIDs. The purpose of this presentation is to provide information on different assessment methods. Amy added that MST is very useful to help determine sources if the fecal coliform sample results are high and a source cannot be identified. Cheryl noted that a lot of information can be gained about potential sources through Walk the WBIDs, which can then help to focus sampling efforts.

Tiffany stated that when the TAT first started sampling several years ago, the MST methods were not as evolved. There are now more markers available that are better refined. Cheryl added that additional markers are available but they chose markers in this study that had been fully tested. Markers for other animals can probably start being used within the next year.

Dana Morton asked if the State has been working with USF on revising the standard for bacteria contamination. Shannon stated that the U.S. Environmental Protection Agency (EPA) met with USF but they were looking for one marker whereas USF recommended using a toolbox approach with multiple makers. EPA is looking for additional research but funding is not

available. USF has worked with FDEP before but they have not discussed the standards. Amy stated that she would follow up with the FDEP to find out about how FDEP is working with the Department of Health to interpret Beach Closure data for beach WBIDs.

Review Results for "Eastern" WBIDs - Red Bay Branch, Miller Creek, Craig Creek, Miramar Creek, and Christopher Branch (*Cheryl Wapnick*)

Red Bay Branch

Cheryl stated that during Walk the WBIDs the participants noted that the flow in the Red Bay Branch watershed was coming from outside of the WBID boundary. PBS&J provided this information to FDEP and recommended that the WBID boundary be extended further north. FDEP is currently discussing this change with COJ.

The sampling results show elevated fecal coliforms throughout basin. With this detailed assessment the worst case areas in the watershed could be identified, which helps to focus management actions. In this WBID, and several others, pipes for pool drains were found discharging to the creek. This is an allowed discharge but important to the assessment efforts because the chlorinated water could reduce the bacteria counts. Another important consideration is that some people recreate in these creeks so the high fecal coliform counts are a public health issue.

The list of sampling stations in the presentation includes all stations for each WBID. The flexible stations listed were not sampled during the entire assessment period. Correlations between bacteria counts and rainfall data are being made using rain gauge data from Weather Underground. Some of the results show that the water is stagnant. Although these data cannot be used in assessing water quality for total maximum daily load (TMDL) listing, sampling stagnant water did help determine potential sources.

On the northwestern branch of Red Bay Brach, human markers were found. The *esp* gene showed 1% human contamination and HPyVs equaled 38. The detection limit for the HPyVs method is 40, so numbers higher than this level indicate a likely human source. The H-Bac marker indicated 100% human contamination. The high level of H-Bac and low level of *esp* may indicate a septic tank source in this area. The western branch was sampled at the beginning of the assessment process but was dry most of the time and did not appear to be a source. Therefore, the sampling on the branch was stopped after a few months. On the main channel at station RB2 the *esp* gene was found indicating 100% human contamination. The high presence of *esp* means the source in this area is most likely sewer. The *esp* gene was also found in this location during a different sampling event indicating 10% human contamination and underscoring that septic tanks are likely not the source near this station. At station RB1, H-Bac was found indicating 30-50% human contamination. The surrounding area is private property so PBS&J was unable to walk this area to see if the source could be identified. The southwestern branch had low counts the first few months of sampling so it was dropped from the monitoring plan.

Donna asked how stormwater could be a source of bacteria. Cheryl responded that stormwater is a conveyance for other sources of bacteria. The first step would be to identify and address the sources entering stormwater. Then, options for stormwater treatment can be pursued, if necessary. In addition, if the stormwater system pipe is not well maintained, bacteria could grow in the system. The technical reports will identify any correlations between rainfall and fecal coliform to help determine if stormwater is a source.

Miller Creek

Cheryl noted that FDEP has been following up on the overflows from the Preserve at St. Nicholas parking lot. There were also problems with the lift station at this apartment complex. The lift station recently changed ownership and the station has been fixed (as of June 17, 2009). This watershed appears to have pet-related sources, including cats and rabbits.

On the southern fork, the results at station ML3 were all below water quality standards except during one sampling event when the water was stagnant. However, there are high levels of IOs in the sediments, which means that there was probably a source in this area at some time. This area of the creek is shaded preventing ultraviolet penetration, so there could be bacteria regrowth in the sediments. It does not appear that the loads from the sediments are entering the water column.

Ed Cordova asked if there has been any studies in waters that are not impaired to see what the bacteria levels are in the those sediments. Shannon stated that USF has performed sampling in unimpaired waters and the results depend on the waterbody and what is going into it. They have seen waterbodies where the bacteria in the sediments are high but are low in the water, places where the counts in the water are high but the sediment is low, and waterbodies where both the sediments and water have high counts.

Cheryl stated that on the northern fork, there were chronic elevated exceedances at ML2 under both flowing and stagnant conditions. All of the markers used at this site came back negative; pets appear to be the issue here. The ruminant marker was used on the northern fork and came back positive on two occasions at TML3A and TML3. In addition, *esp* was found at TML3 but only indicated less than 1% human contamination. On the main channel at TML6, at first there were low counts and then exceedances were observed. This could indicate a new source at this location or transport from upstream.

Due to the issues and high counts at the Preserve at St. Nicholas, additional stations were added in this area to help with source identification. The stations in this area had episodic exceedances. At TML4, *esp* was found indicating less than 1% human contamination and H-Bac came back positive but there were problems with the analysis so the lab could not quantify its presence. TML2 also had high spikes and a positive H-Bac marker indicating 10% human contamination.

On the eastern branch, several dogs were observed and there is frequent flooding in this area that causes sewage backup in homes from septic tanks. These homes were built in 1940s and there are laundry potential illicit connections (PICs). It is possible that a drainage project in this area could help, although stormwater is not the only problem in the area. A laundry PIC was found near TML4 and the pipe was previously covered by leaf litter so additional investigations may be necessary to identify other PICs. At ML1, the counts were higher than what they were upstream. This is a septic tank area and HPyVs was found at 143 counts. The source in this area appears to be human although there is also a lot of garbage and cats. The main channel had some low level exceedances, which could be source transport from other areas.

Justin Levine stated that he observed human feces at TML1 after the sampling project was completed. A homeless population could be a source here. Amy asked if the trash observed at ML1 was in the area or in the water. Cheryl responded that there is a dumpster in the area that

is always overflowing. Justin added that there were articles in the paper and on the news about this dumpster. The company hired contractors to clean up the area and fence the dumpster. This clean-up occurred in last few months.

Craig Creek

Cheryl noted that the highest geomeans in the watershed were at site CC2 in both the water and sediments. There are homeless that sleep in the culverts in this area. FDEP sampled station CC2 during the project.

On the main channel, sites TCC4 and TCC3 had sporadic inputs, which caused exceedances. The sediments at TCC3 had varying levels of IOs, likely indicating a more recent source of contamination. Both TCC2C and TCC2B had relatively low level chronic exceedances. Along the 2nd Trib, which has a smaller volume of water, the bacteria levels were consistently high with some over 10,000 counts. Human makers were found three times: H-Bac indicating 1% human contamination and HPyVs at 187.8 and 166.8 counts. This is an indication of human contamination in this area. There was also one positive for the ruminant maker. The 2nd Trib is a shaded short channel that ends at a wetland area in a residential neighborhood. The contamination appears to be coming from this residential area. JEA dye tested the sewer line in this area and no leaks were detected. In addition, the sewer lines along Thornwood Lane had been updated through cured in place pipe (CIPP) on August 20, 2009. The laterals to the homes on this road are still vitrified clay (VC).

Amy asked if the homeowners know that they have VC pipes and what that means. Ed responded that he thinks that homeowners do not care as long as their sewer system is working. JEA could probably look at their infrastructure maps to determine what types of pipes are in different areas, unless the JEA system in an area has already been upgraded. Cheryl added that the type of pipe could probably be determined by looking at the age of the home. Most of the homes from the 1940s likely have VC pipes. This can be a problem because tree roots can break the pipes and the lines can degrade over time.

Cheryl stated that chronic exceedances were observed at TCC1B on the main channel. CC1 also had elevated bacteria levels but no human markers were found. One ruminant maker came back positive and this is a park area so there is the potential for wildlife. There was evidence of a sanitary sewer overflow (SSO) near 2750 Hendricks Avenue. JEA is looking into options to determine the cause of the SSO. On the southern branch, station TC1 had episodic highs. The human markers at this site came back negative but the ruminant maker was positive.

Craig Creek was flown for thermal imaging and 15 anomalies were found. None of the anomalies were identified to be bacteria-related. The pre- and post-flight sampling occurred at 11 stations. The thermal imaging report is posted on the FDEP FTP site.

Miramar Creek

Cheryl stated that based on the Walk the WBID observation, she put in a recommendation to FDEP to change the Miramar Creek WBID boundary. The boundary would be smaller and it would cut off at St. Augustine Road because everything to the east is flows away from the creek. Miramar Creek had one of the highest geomeans of the ten WBIDs. Many of the stations had high counts in both the water and sediments. Several of the stations had lower enteroccoci levels in the sediments, which indicate a more recent source. There is a house in

the basin that has a mounded septic tank with a deck built into it. DCHD needs to follow up on this issue.

There is no sewer along the northern portion of the main channel although high counts were observed. This is a septic tank area with lots of pipes in the creek banks and COJ is going to follow up on the PICs in the area. Sampling at stations TMR3 and TMR2 were discontinued because they had low counts. Station MR5 was in the Orlando Circle area with a lot of PICs. The *esp* marker was found on two occasions indicating greater than 10% and less than 1% human contamination. This would indicate that septic tanks are not a source. However since there is no sewer the tanks could be straight piped to the creek and, therefore, not filtered through the drainfield which would affect the presence of the *esp* marker. This was an issue that was observed during the JEA project in 2005.

On the northern branch, there were higher numbers downstream of the municipal separate storm sewer system (MS4) outfall. The H-Bac maker was found indicating 100% human contamination. There were no thermal anomalies in this area but when PBS&J field verified the anomalies they found some pipes that may be potential illicit connections and notified COJ so the city could investigate. High counts were found at the ditch above Hendricks along with a low concentration of *esp*, which could indicate that septic tanks may be the source. At the sampling point behind the JEA lift station, two ruminant markers came back positive. There were very high bacteria levels in this area, which seem to be caused by a combination of upstream sources, dog feces, and wildlife. This area is also shaded and shallow with high levels of IOs in the sediments.

The main channel had chronic low level exceedances that increase further downstream. Station MR1 was positive for H-Bac indicating 20% human contamination. Further investigation is needed in this area; however, there is a lot of private property that was inaccessible during this project. The thermal imagining indicated nine anomalies and samples were taken at six stations.

Scott Turner stated that for the direct pipe from a septic tank found in 2005, DCHD issued a repair permit and the drainfield was moved away from the creek. DCHD was asked to conduct more intensive investigations in this area as part of the basin management action plan (BMAP). This is an interesting area because many of the parcels cross the creek so the drainfields can be placed in unusual locations.

Christopher Branch

Cheryl stated that a homeless population was observed in the area near the pond. There have also been issues with the Dollar Tree lift station, which is operated by Richard Weeks. This station had a broken float, a hole in the wet well, and is not locked but is now repaired. Dana stated that the operator certification process is very weak and COJ has talked about how to improve this process. Betsy Deuerling added that cost to maintain the lift station is an issue and Richard Weeks fills a niche for low-cost lift station maintenance. He does tell them what is wrong with the station and how much it will cost to repair; however, he lets the client determine if the station should be repaired. Dana noted that COJ is notified if there is an issue with a private lift station but COJ has not determined the best way to deal with a problem with an operator.

Cheryl noted that low levels of bacteria were observed on the northern branch and southern branch of the northern fork. The main channel of northern fork has higher levels and further downstream there are more chronic issues and positives for both human and ruminant markers. On the southern fork, the northern branch had chronic high levels and a lot of stagnant water. The southern branch also had a lot of stagnant water and some high exceedances. On the main channel, *esp* was found indicating 10% human contamination, which is probably due to the sewer infrastructure in the area. On the main channel, station TCB5 had a positive for H-Bac indicating 100% human contamination. There is a JEA lift station in this area with a strong odor, which in itself is not unusual. In addition, this is a low lying area that is sewered so investigations may be needed. Cheryl is waiting to hear from Ron Nelson (JEA) on whether sewer repairs have occurred in this area. On the northern branch, high bacteria concentrations in the sediment were observed and based on the levels of each IO it appears that the bacteria are from a more recent source.

Review Results for "Western" WBIDs - Long Branch, Hogan Creek, McCoy Creek, Big Fishweir Creek, and Williamson Creek (*Cheryl Wapnick*)

Long Branch

Cheryl noted that the geomeans in Long Branch were relatively low and the concentrations in the sediments were highly variable, especially at sites LB2 and LB3. On the southern fork, H-Bac was found at TLB3 indicating 100% human contamination. HPyVs was also found at 19 counts. There was a history of SSOs in this area but JEA has made a lot of improvements to the sewer systems. At station LB3, the counts were relatively low with a few exceedances; however, the bacteria levels in the sediments were variable and it appears that there was recent contamination at this site in January. On the northern fork there were low levels at each of the sampling stations. In this area, the sources appear to be a combination of sewer and stormwater. On the northern branch, station TLB1 was sampled for four months and did not have high counts. Station TLB1A was located in the downstream portion of the cemetery and higher bacteria levels were observed. In addition, H-Bac and *esp* were found indicating 10% human contamination and HPyVs was found at 17 counts. It appears that the source in this area is human and there was evidence of homeless in the area.

Amy noted that at one point Dr. Jody Harwood (USF) thought that the cemetery might be contributing to the bacteria. Shannon noted that USF has a sampling site in Tampa and they found higher counts near a cemetery in that area, too. Cheryl stated that she was not aware of any scientific papers that discussed this issue. Shannon stated that she would think that the bacteria would only come from those bodies that are not embalmed. Cheryl noted that although there is a Jewish cemetery there, she does not think the human markers would survive and since the markers were found, the source is more likely the homeless population.

Cheryl stated that the main channel at LB2 had evidence of homeless. Human markers were found on two occasions with H-Bac and *esp* showing about 0.5% human contribution. There was also evidence of garbage in this area. Station LB1 only had small exceedances, which was likely from upstream sources.

Hogan Creek

Cheryl noted that the geomeans in Hogan Creek are relatively low in both the water and sediments. Confederate Park pond is located in the basin and is populated by many ducks. This pond overflows to the creek. In addition, there was evidence of homeless in this area.

On the main channel, garbage was found near THC5A, which was downstream of the railroad tracks. The counts were fairly low until May when there was a spike in bacteria concentrations. In addition, H-Bac was found at this time indicating 50% human contamination and HPyVs was found at 2,951 counts. Station THC5 seems to be affected by upstream sources. HPyVs was found at this location at 143 counts. From the sediments, it appears that there has been recent contamination. Based on the sampling on the northwestern branch, this area does not seem to be a source of bacteria. On the main channel, the counts at HC3 were low so it appears that any contamination upstream is not making it to this location.

COJ has conducted some maintenance at the headwaters of the creek. They cleaned garbage from this area and within one month, the garbage built back up. It appears that people come to this area to dump their garbage. Amy stated that she had asked for no dumping signs to be posted but this land belongs to the railroad and not COJ. Betsy noted that there is a fence across the creek and it could be catching the litter after storm events.

Cheryl stated that TH2 on the southwestern branch had high counts, some of which were over 20,000. HPyVs was found on two occasions at 68 and 584 counts. Station THC3A had three outfalls upstream of this area so flexible stations were added at each outfall to look for sources. There was evidence of homeless near THC3A, which could be contributing to the high counts. The creek to the west of I-95 is all underground and PBS&J's recommendation is to sample some of the stormwater manholes to determine if the high counts are coming from the underground conveyances. JEA may also need to check for grease blockages because there have been two SSOs in the area and the areas JEA dye tested did not indicate a problem in the collection system.

On the main channel, higher counts were observed further downstream. HPyVs was found at several sites and the source appears to be homeless populations and sewer infrastructure. Amy noted that there was a trunk main in the area that previously had problems and she asked if the bacteria from the overflows could stay in the sediments. Cheryl responded that she was unsure but the bigger concern is the amount of flooding in the basin. Ed noted that JEA is waiting to update their infrastructure until a COJ drainage project is completed in the area.

McCoy Creek

Cheryl noted that on the northern fork, both the northern branch and southern branch had low bacteria levels, except for one high count in the southern branch. There was a sewage smell near MC3 and the sample from this area had high counts. This area is also flood prone. On the southern fork, there were only slight exceedances. The *esp* marker was found at TMC1 indicating 20% human contamination. There was a manhole that overflowed on Edison (close to the creek) in September 2008. Cheryl found evidence of another SSO at this location in July 2009. JEA fixed the manhole in August and it appears that something upstream is causing the overflows. It may be beneficial to add this manhole to the monitoring program because this area floods. Ed noted that JEA is expanding their manhole monitoring program but if the overflows are due to infiltration there is little JEA can do to address the issue. Cheryl suggesting looking at the SCADA data for the lift station upstream to see if the issue could be with the station pumps.

On the main channel, *esp* was found at MC2 indicating 1% human contamination. In addition, correlations between fecal coliform and rainfall (2-, 3-, 4-, and 7-day) were observed. At MC1, H-Bac and *esp* were found indicating 10% human contamination. The source could be

transported from upstream or the infrastructure in the area. Correlations between fecal coliform and rainfall were also observed at this station. The thermal imaging showed 27 anomalies and sampling occurred at nine stations. COJ will field verify these anomalies but the sampling showed low fecal coliform counts.

Big Fishweir Creek

Cheryl stated that Big Fishweir Creek had high geomeans for both water and sediments. Evidence of dog feces was found near the creek and wildlife tracks were observed near BF2. The Loop restaurant located in this basin had repetitive SSO issues.

On the western fork, most of the stations had low counts until TBF6, which had high counts and a positive for *esp* indicating 100% human contamination, likely from a sewer source. The sediments also had very high counts. There is a strong human source between TBF6 and TBF7, which has a lift station nearby. There have been a lot of repairs at this Quan Drive lift station because of issues with rags clogging the pumps, which affects the pumps' runtimes. Station TBF6A is located within a septic tank failure area and high counts were observed at this site during one sampling event. Station BF3 had many exceedances and H-Bac was found indicating 10% contamination. HPyVs was also found at 12 counts. The water near this station comes from a wooded area so wildlife may also be a source of contamination. TBF5 had only slightly elevated levels and no human markers.

On the eastern fork, TBF3 had the most exceedances and H-Bac was found indicating 10% human contamination and HPyVs was 216 counts. There is a lot of infrastructure in the area and this was a septic tank phase-out area that still has septic tanks, some of which are close to the creek. On the main channel, station BF2 is near the The Loop restaurant, which had two SSOs during the eight month sampling period. The first SSO did not reach surface waters but the second one did. This area also has wildlife and a lot of flushing because the creek is tidal; therefore, the bacteria counts are likely higher than what was observed.

Little Fishweir creek had 10% human contamination at TBF2A and 100% at TBF2. There are trunk lines and gravity mains in the area and one septic tank, which may need to be inspected. The thermal imaging found six anomalies on Little Fishweir. When PBS&J field verified in this area, they found a pipe crossing the stormwater system and JEA confirmed it as a gravity sewer connection. This line has not been checked for leaks. The remainder of the anomalies was not bacteria related.

Williamson Creek

Cheryl stated that the southwestern fork had the highest concentrations at WC3 under flowing conditions. The *esp* marker was found indicating with 1% human contamination. HPyVs was also found at 61 and 85 counts. On January 27, 2009, JEA completed a manhole repair and CIPP replaced iron pipe in this area. On March 23rd, JEA dye tested all of the gravity mains entering the manhole at WC3 and did not find any leaks. JEA will investigate in the upstream residential community and determine how to perform additional investigation of the force main. The highest bacteria counts were observed coming in downstream of the most downstream gas line. Additional sampling in this area may be needed before continuing with the investigations.

The southeastern fork did not appear to be a source. The northern fork had very low counts. On the main channel below the confluence of the forks, there were low exceedances and evidence of homeless. The southern branch also had low level exceedances but very high

sediment levels. There is a gravity main in this area that may be contributing to the bacteria contamination. It does not appear that the sediment load is contributing to the levels in the water.

Upcoming Meetings and Wrap Up (*Tiffany Busby*)

Cheryl noted that the next step is to complete the technical reports for these WBIDs. After discussions with Amy, PBS&J will reformat the reports to highlight the benefits of the intensive assessments. The first section of the report will be similar to the other technical reports with the old data. The next section will focus entirely on the new information by area of each creek. The third section will discuss the management actions. The new format will be used starting with Williamson Creek. Dana asked when will Cheryl stop following up on actions from the assessments. Cheryl responded that she will stop once the report has been written but then Amy will take over.

Tiffany stated that the Basin Working Group meeting will be held on December 10th to kick off the second BMAP. Tiffany thanked everyone who submitted their project sheets and noted that FDEP has set up teleconferences with the new entities to discuss some follow up questions on their project sheets. The next technical meeting is tentatively scheduled for January 14, 2010. A notice will be sent closer to this date on whether a meeting is needed or not.

Amy stated that she received a question about the nutrient and dissolved oxygen (DO) TMDLs for the tributaries. The earliest that these would begin the BMAP process would be the end of 2010 or early 2011. The second fecal coliform BMAP must be completed first. Amy noted that she is not sure which tributaries will be included in the nutrient/DO BMAP. Tiffany added that there has been some confusion about the fact that the tributaries TMDLs are separate from the nutrient main stem TMDL and BMAP. If an entity has an allocation in the main stem BMAP, it does not mean that they will not receive a separate allocation in the impaired tributaries.

Dana asked about the TMDLs that EPA is developing because some of the targets seem stringent and the basin information in several TMDLs was incorrect. Amy responded that Wayne Magley is working with EPA on these TMDLs. EPA set the targets for their TMDLs based on natural conditions, which may not be reasonable in the urban areas. Tiffany noted that any comments about the documentation in the TMDLs (counties, roads, boundaries, etc.) should still be submitted to EPA to ensure the details are correct. Amy requested that entities submitting comments to EPA for these TMDLS copy FDEP.

Janet Hearn asked why EPA did not propose the FDEP TMDLs. Amy responded that the main reason was that the FDEP TMDLs did not require that a DO level of 5 mg/L be maintained at all times. EPA wanted to use natural background conditions so they took the FDEP TMDLs and enhanced them. Janet noted that she thought she saw some of the TMDLs that EPA is working on in the rule. Amy will check the rule to see if some of the EPA TMDLs were included.

Adjournment (*Amy Tracy/Tiffany Busby*)

The meeting was adjourned at 2:25 PM.