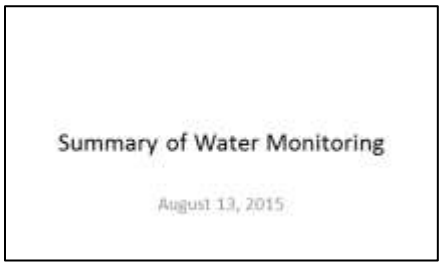
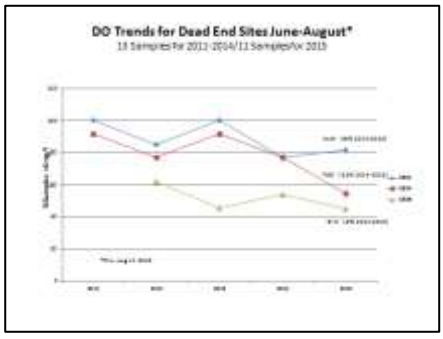
TOWN OF SOUTH BETHANY
Canal Water Quality Committee Meeting Minutes
Thursday, August 13, 2015, at 1:00 PM
Location: South Bethany Town Hall

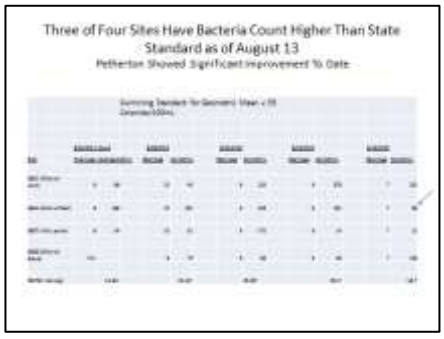
1. Call meeting to order	George Junkin
2. Monitoring at 10 sites and continuous monitor	Dave Wilson George Junkin
3. Status of Grant Activity at Sandpiper Pines and York Canal	George Junkin
4. Improved Circulation in canals, Grant opportunity	Jack Whitney
5. Improve operation of forebay	Jack Whitney
6. Oyster Gardening	Tony Caputo
7. What else should we be doing?	All
8. Adjournment	

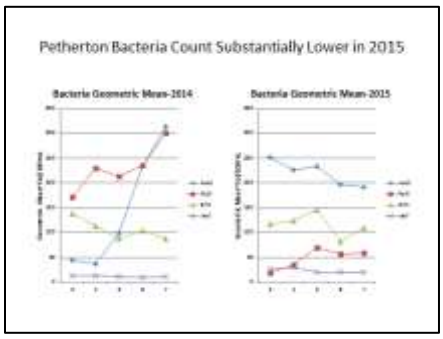
Agenda Item 1. – George called the meeting to order at 1:00. Committee members present were George Junkin, Tony Caputo, Joe Danches, Frank McNeice, Dave Wilson, Ron Wuslich. Wayne Schrader arrived late at about 2:30. Jack Whitney was not present due to other commitments but left the committee a detailed report for inclusion in the minutes. Jay Headman tended his resignation so that he could move onto other endeavors. Mike Materia attended as a member of the public.

Agenda Item 2. – Dave Wilson presented the following charts.









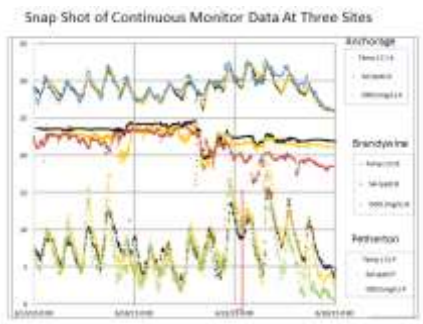
Items to take away from this and previous presentations are;

- Nutrient analysis for 2009-2014 showed 35% reduction in Dissolved Inorganic Nitrogen in 2014 Relative to Years Before Rte 1 Storm Drain Improvements
- Improvement in DO and Bacteria at East End of Petherton
    - 22% reduction in # DO samples <4 mg/l relative to 2014
    - 80% reduction in bacteria count relative to 2014 (to date)
    - No one had a theory as to why there was such an improvement in DO and Bacteria at the east end of Petherton
- Bacteria levels still exceed state standards at 3 dead end sites
- DO levels are still less than the 4mg/L threshold at the dead end sites at least 50% of the time during the summer months

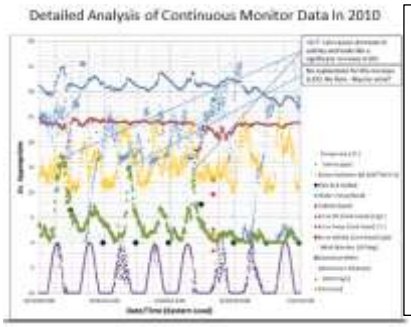
Ron Wuslich requested that George research some historical Bacterial levels for the South Bethany Canals. As he remembered, the 17,000 Total Enterococcus colonies per 100mL, seen last year, was the highest reading ever seen in the SB canals. George checked the data and he could not find a higher value in the SB canals. He did find a reading at the Assawoman Canal at Kent Ave. of about 20,000. Each individual reading for the SB canals is shown in the table to the right, as reported by Ed Whereat. It shows the 17,329 reading that Ron remembered on 7/8/2014. This was after a 1.2 inch Rainfall on 7/4. It also shows two very unexpected high readings at SB-07, Mid Layton, of 14,136 and 5,475. Mid Layton usually has readings that meet the safe swimming standard.

Summary Table with Geomeans				
Date	SB01	SB04	SB06	SB07
1/15/2013	161	30	10	41
2/12/2013	31	63	52	62
3/12/2013	30	74	20	10
4/9/2013	20	20	10	10
5/7/2013	5	31	145	20
5/21/2013	487	145	305	51
6/4/2013	2909	3873	6131	14136
6/18/2013	121	4611	691	51
7/9/2013	121	1086	160	41
7/23/2013	63	5492	97	132
8/6/2013	388	213	74	41
8/20/2013	30	226	86	10
9/10/2013	63	160	464	10
10/15/2013	52	107	31	10
11/12/2013	20	798	135	10
12/10/2013	771	1017	1396	5475
1/14/2014	10	84	5	5
3/11/2014	20	50	5	20
4/8/2014	74	187	305	52
5/6/2014	31	98	84	10
5/20/2014	41	275	105	5
6/10/2014	20	546	63	10
6/24/2014	4884	158	31	5
7/8/2014	17329	373	256	10
7/22/2014	1860	1376	31	31
8/5/2014	8164	86	20	20
8/19/2014	2909	98	10	30
9/2/2014	4352	201	132	5
10/7/2014	1722	63	20	5
11/4/2014	97	107	97	74
2013 geomean	87	272	128	51
# of samples	16	16	16	16
2014 geomean	373	165	42	13
#of samples	14	14	14	14

George presented the following charts that are examples of Continuous monitor data;



- The chart to the left shows that the three canals with continuous monitors give essentially the same trends for temperature (the upper three curves) and for dissolved oxygen (the lower three curves).
- The chart shows decreases in salinity that occurs during rain events. These are more pronounced in the Anchorage Canal since it sees at least 10X more storm water during a rain event.
- This particular chart was requested by the weekly monitors to check their unusually high DO readings on 6/23/2015.



- The chart to the left shows that the daily changes in DO (the green points) are driven by solar radiation (the blue points). When the sun is out the algae makes O_2 by photosynthesis. At night the algae east the O_2 in order to live.
- Other variables (such as temperature, rain, salinity, wind) have an influence.
- Temperature and Salinity have a significant effect which can be seen in an annual plot. The chart to the left does not cover enough time to see these influences.

Agenda Item 3. – George presented the following charts;

Agenda Item 4. & 5. – Below is a copy of Jack Whitneys Memo to the CWQC;

MEMO

TO: Members of the South Bethany Water Quality Committee
From: Jack Whitney
Subject: August 13, 2015 Water Quality Committee Report and Recommendations

I apologize for not being able to attend the meeting. I must take my Daughter and Grand Daughter to BWI for their flight back to LA at the time of the meeting. Regardless, following is the status of the two efforts I have been tasked to look into:

1. Improved Water Circulation in Our Canals

George reported a possible DNREC grant that may be available for us a couple weeks ago. It is, unfortunately, due for submittal in late August 2015. This tight time schedule is severely limiting the time available to prepare and secure approval in this time frame. Regardless…..

I have drafted a SOW for a study to define method to improve water circulation in our canals. I have also communicated and shared my draft SOW George and the Mayor and also with 3 consultants. The SOW defines the proposed study to model our canals and investigate alternate ways to increase water circulation in our canals. I have received feedback from all 3 of the Consultants about the SOW and will include appropriate

revisions in the final SOW when it is prepared. The proposed study would be to identify ways to increased water circulation would also improve water quality - to at least that of the water quality in the outer bays. The brief explanation I attached to the draft SOW submitted to the Mayor is as follows:

Discussion and background for Town Council Funding Consideration

One of the possible ways to increase South Bethany canal water quality is to improve circulation of the water in the canals. One of the most cost effective and ecofriendly ways to do this could be to construct new outfall connections at the ends of the Carlyle and York canals and attach these canals to the outside bay area. Connections to the outer bays could be through the use of underground piping from the canals or through a structure under the roads. It may be possible to use constructed surface canals within the existing wetlands to channel water in and out of the adjacent bays. Regardless, the provision of connections between our canals and the outer bays could enhance water quality by increasing the water circulation (particularly at the dead led canal locations) in the South Bethany canal system.

Depending on the feasibility, the connections to the outside bay could be extended to the highway canal (from Anchorage canal to additional poor performance canals running south) and to the other east-west canals, which run parallel to the Anchorage canal. However, none of this could be accomplished without the design of a hydraulic model that predicts and defines the flow of water in, out and through each branch of the canal network and a study of the options, costs and related benefits for each option studied. The results of the initial canal water circulation model are necessary for use as a basis of design and analyses of the resulting changes that would result when these canals are connected to the outer bay.

This proposal is to request Town Of South Bethany funds to augment potential DNREC grant funds for the initial (Phase 1) feasibility study outlined above. The benefit of the SB Canal Model would be to provide a tool for use to determine the feasibility of constructing part or all of the necessary underground connections to achieve additional canal circulation and enhance the water quality of the South Bethany canal system. This concept could provide a low impact method of naturally enhancing circulation through the canals at a substantially lower cost (without other potential risks) than the previously proposed tidal pump. If pumping is necessary to achieve the desired results, this study will also provide the answers necessary to determine if that approach is feasible and should be undertaken. Additionally this option will provide an additional source of water for circulation from the adjacent bay, which is the same as the current source of water feeding the canals, rather than from the ocean as previously investigated. As a result, this approach will have much lower environmental impact to the existing and established ecosystem than the introduction of higher salinity and colder ocean water.

Although it is debatable if natural means would allow us to achieve our circulation goals or is some pumping assistance needs to be provided, the study will give us the answers to this. Regardless, the first part of the study is to model the existing canal conditions and look at existing flows during normal tides. The second part is to look at the impact of opening the end(s) of Carlyle and/or York canals to see the impact of this on the canal system. Next is to look at the provision of openings interconnecting the northeast canals into the Carlyle canal and see what happens during natural tidal flows. The last step is to look at methods to provide assisted circulation (especially from the NE canals into the Carlyle canal) using electrical and/or air lift pumps.

While it is possible we may need to use some pumping assistance to improve flow, we would need to find the minimum pumping assistance necessary to achieve our circulation goals to ensure sustainability. The grant now available is a matching grant based on cash - not services. I estimate this study will cost around

$20k so the Town contribution would be $10k.

RECOMMENDATION: With all that said, I recommended t**hat we table the request for Council approval of the necessary funds and the preparation of the grant application for now** - based on the response we received from the Mayor. The fact is that the deadline is simply too tight to complete a the grant application now and waiting for the next grant opportunity will give us more time to refine the SOW and also compile and submit a successful grant application. I have too many other things I need to do before the end of August (the application deadline), and I cannot spend an adequate amount of time on this to ensure we are successful. The Committee should be aware that we only found out about the grant opportunity a week or two ago.

2. Improvements to the Storm Water Fore-Bay at Anchor

The second most important project we need to do is to increase the storm water treatment capacity of the fore-bay at Anchorage. At present this is owned and operated by DelDot. Regardless, if the fore-bay treatment system was designed and sized correctly, it would be capable of treating all the storm water coming down Ocean Highway and into the anchorage canal – without any costly changes to the current infrastructure (other than the fore-bay itself). This would allow for the overall system be far more economical and sustainable than using the smaller, maintenance intensive systems we have now in place or are planning north of the Anchorage canal.

Specifically, I recommend that the Town of South Bethany (with us) initiate and engage in discussions with DelDot and Sea Colony (and others, maybe CIB?) about teaming with them to seek funding for and to design and enlarged the fore-bay treatment system on the undeveloped Taylor Goodie property at the intersection of Anchorage and Ocean highway. As part of the plan, Sea Colony would be asked to abandon the idea of installing a large, costly and maintenance intensive storm water retention pond on the east side of Ocean highway by the Sea Colony high rise building (as I understand is now planned) and agrees to use those funds to help purchase the Taylor Goodie lands and/or to assist with funding of the design and construction of the new expanded fore-bay treatment system.

After the above preliminary considerations are determined to be feasible and agreed upon in principle by the appropriate parties, cost estimates for all project costs would have to be prepared and funding sources identified. Regardless of the process, the discussions and investigations needs to begin before Sea Colony has gone too far to alter their course. I do not know specifically where they are but it is possible George may.

It is also possible (if approached properly) the Town could reach some agreement with Mr. Taylor about an appropriate purchase price or the donation of this property to the Town - since it is not buildable at this time. Could we dedicate the new treatment system to Goodie Taylor? It could look like a wetland park.

If securing the Goodie Taylor land is discovered to not be an option, it may be possible to expand the fore-bay within the median strip of Ocean Highway. This would not be as good, but it could provide enough area to make an improvement to the existing fore-bay system. Use of the Goodie Taylor property should be investigated first.

Either way, the benefits of this concept are the achievement of a more suitable and sustainability storm water treatment system, which has been much needed as part of our efforts to improve water quality in our canals. It could also help to centralize and reduce maintenance costs of storm water treatment for runoff areas north

of Anchorage Drive. The new system should, logically, be operated and maintained by DelDot.

Please advise me if you would like additional information about anything above.

Respectfully submitted, Jack Whitney, August 13, 2015

Discussion on memo related to Agenda Item 4. – Improved Water Circulation in Our Canals

- The committee agreed with the need to go forward with the type of analysis described in Jack's memo.
- Without an analysis it is just opinions, not fact.
- The consensus of the committee was, that if tidal action was to supply the circulation, the size of the connection to Jefferson Creek would be on the order of the cross section of the canal. The required size would have to be verified with the analysis.
- The committee agreed that we could not go after the grant that had a due date of 8/26/2015, since we had stopped work on the proposal due to concern about Council backing.
- George made a motion seconded by Ron that George go forward to Council with a proposal that Council amend the budget to commit $10,000 that could be used as cash match to pursue a grant to study methods to improve circulation in the South Bethany Canals. The motion passed unanimously by the CWQC. (note: Council supported the $10,000 budget amendment by a vote of 4 to 2.)

Discussion on memo related to Agenda Item 5. – Improvements to Storm Water Forebay at Anchorage

- The committee agreed with the need to go forward with improvements to the forebay at Anchorage. The current forebay is only about 30% efficient. It is too small for the amount of storm water that is directed to it.
- The committee agreed that we should continue to work closely with DelDOT, the CIB, Sea Colony and other stake holders to continue the efforts started with the *Conceptual Pollution and Stormwater Control Strategy for the Anchorage Canal Drainage Area*, June 2010.
- The consensus of the committee was that we should not discourage the effort that the Sea Colony and the CIB are undertaking to obtain a grant for a wet pond on the triangular piece of land just south of the bank, across the street from Sea Colony. The committee felt that we should continue to encourage all efforts that kept stormwater and pollutants from reaching the Anchorage Forebay. The committee felt that if we were to discourage the wet pond activity at Sea Colony we would alienate valuable partners in our quest for cleaning up the water that enters the Anchorage Canal.
- Ron Wuslich recommended that members of the CWQC meet with Jon Mueller, head of the Chesapeake Bay Foundation Law department. Jon helped the Inland Bays Foundation get formed in November of 2011. Ron discussed the issue of DelDOT putting stormwater into the Anchorage Canal. His recollection was that if certain toxins were known to be in the stormwater, DelDOT would have to find an alternative to using an undersized forebay. Ron suggested that members of the CWQC meet with Jon.
- There was discussion that the forebay could be declared a Small MS4 under the Clean Water Act. Ron reported that the IBF will more than likely submit a petition to DNREC asking that they designate the Anchorage Outfall as such.

Agenda Item 6. – Tony Caputo presented the following;

To: Canal Water Quality Committee Meeting attendees
From: Tony Caputo
Date: August 13, 2015

Subject: Oyster Gardening report

- I've offered to communicate with oyster gardeners, which I plan to do via email
- C I B runs our oyster gardening program
- It started in 2003, so the program is about 12 years old
- I was in the program for 5 years but dropped out about 6 years ago, because of poor communications, and I plan to rejoin this year
- CIB holds an annual meeting for Gardeners and they periodically send out emails, so if a Gardener does not pay attention or go to the annual meeting you are uninformed
- The program ramped up to about 140 gardeners and today there are about 100, and that's where they want to manage the program today
- Of the 100 here are about 40 with Bethany Beach Post Office addresses, these are the gardeners I plan to communicate with - including Bay View and Bethany Beach as well as S Bethany
- Gardening was started as a Demonstration Program, or an Experiment
    - See if the oysters will grow in our environment
    - Effects of growing – for example they are their own ecosystem
    - Collect information over years
    - Today there is less emphasis on Gardening more on larger oyster projects, such as the reef failure, Rip Rap planting, large cages (York C.) and commercial fishing
- CIB has had some difficulty growing Spat this year and they are behind by over a month
- CIB now plans to distribute new SPAT in about 3 weeks, new SPAT is grown and delivered every 2 years
- Commercial Oystering used to take place in Indian River but oysters were wiped out about 40 years ago because of two diseases, MSX and Dermo
- Rutgers U developed a MSX and Dermo resistant oyster
- These are the oysters used in the Gardening Program
- The program's Footwork is mostly performed by Graduate Students from Del. State U.
- The oysters for Gardeners are grown in Taylor Floats, they are 2' x 3' floating cages with two smaller baskets inside with about 18 mature oysters in them after 2 years
- Oysters are grown over 2 years, starting with "Spat" starting on shells and over 2 years they get about 3" in size
- The Spat are grown in Lewes in a big plastic pool from Larve, it takes about 2 weeks
- Then CIB delivers new Spat to gardeners, and they take the 2 year old oysters
- Oysters can filter up to 50 gallons of water a day, but they need water circulation to be optimal
- Some Gardeners are more successful than others for a variety of reasons, circulation and Gardener cleaning play a role. Some gardeners fail and others are highly successful.
- That's it.

Agenda Item 7. – What else should we be doing?

- Since it was already passed 3:00, George handed out the following two pages for the CWQC members to review at their leisure. The pages were from planning documents that were created last year. Some of the items have been completed. Some are in process. The discussion on these topics will be required to develop a budget request for next year.

Agenda Item 8. – Adjournment

- At about 3:15 Frank made a motion to adjourn, Wayne seconded it. Motion passed unanimously.

STRATEGIES	2014 OBJECTIVES	2015 OBJECTIVES	OBJECTIVE MEASUREMENT	2014 MEASUREMENT GOAL	Lead	Support	When	5/1/14 - 4/30/15 BUDGET REQUIREMENT	CHALLENGES ISSUES/STATUS
					Melvin Cusick Town Manager	Don Chrobot Maintenance Supervisor Maintenance Dept.	On going	Public Works Operating Budget $210,178	Budget and economic restrictions
1.2 Further develop canal strategy to improve water quality in support of goal to make the South Bethany Canals "Fishable & Swimmable."					George Junkin Canal Water Quality Committee Chair				
	1.2.1 Update Comprehensive Plan to reflect Water Quality Goal.		CP is updated to reflect goals	CP is updated to reflect goals	Dick Oliver, Chairman Planning Commission	George Junkin Canal Water Quality Committee Chair	10/1/14	0	
	1.2.2 Educate community		Number of public meetings and communications	At least one meeting and one mailing	George Junkin Canal Water Quality Committee Chair	CWQ Committee	6/1/14	$1,000	Many homeowners do not attend meetings and do not read mail.
	1.2.3 Minimize nutrient inputs to the canal by completing the east side rain gardens		Dissolved Oxygen levels increase. Less Algal Blooms. Decreased bacterial levels.	Absolute level is very difficult to quantify, since there are so many variables.	George Junkin Canal Water Quality Committee Chair	Sue Callaway, CEC	6/1/14	In current budget	Objective measurements are difficult to quantify
	1.2.4 Minimize nutrient inputs to the canal by installing stand pipes in SB's catch basin.		Dissolved Oxygen levels increase. Less Algal Blooms. Decreased bacterial levels.	Absolute level is very difficult to quantify, since there are so many variables. Stand Pipes in all "New" Catchbasins	George Junkin Canal Water Quality Committee Chair	Don Chrobot, Maintenance Supervisor	Completed 12/30/2013	0	Objective measurements are difficult to quantify
		1.2.5 Decrease nutrient pollution in canals by installing large oyster cages and floating wetland gardens.	Dissolved Oxygen levels increase. Less Algal Blooms. Decreased bacterial levels.	Absolute level is very difficult to quantify, since there are so many variables.	George Junkin Canal Water Quality Committee Chair	CIB	12/30/15	$5,000	Objective measurements are difficult to quantify
		1.2.7 Obtain a grant to install rain gardens around the 14 Sandpiper Pines storm catch basins.	Dissolved Oxygen levels increase. Less Algal Blooms. Decreased bacterial levels.	Absolute level is very difficult to quantify, since there are so many variables.	George Junkin Canal Water Quality Committee Chair	CIB	6/1/15	$10,000	Objective measurements are difficult to quantify. Some of the catch basins are on private property. Matching funds are required.

STRATEGIES	2014 OBJECTIVES	2015 OBJECTIVES	OBJECTIVE MEASUREMENT	2014 MEASUREMENT GOAL	Lead	Support	When	5/1/14 - 4/30/15 BUDGET REQUIREMENT	CHALLENGES ISSUES/STATUS
		1.2.8 Adopt new codes to further reduce stormwater runoff from properties.	Dissolved Oxygen levels increase. Less Algal Blooms. Decreased bacterial levels.	Absolute level is very difficult to quantify, since there are so many variables.	George Junkin Canal Water Quality Committee Chair			0	Homeowners do not want additional restrictions.
	1.2.9 Continue Diffuser Pilot Project.	1.2.9 Continue Diffuser Pilot Project.	Dissolved Oxygen levels increase. Less Algal Blooms. Decreased bacterial levels.	Absolute level is very difficult to quantify, since there are so many variables.	George Junkin Canal Water Quality Committee Chair		On Going	$2,164	Objective measurements are difficult to quantify.
		1.2.10 Continue to collaborate/team with DNREC, CIB, other state agencies and local vendors to pursue grants and assistance with projects	Obtain a grant that will reduce nutrient inputs to canals. Enumerate the meeting attended.	South Bethany receives at least one grant and assistance	George Junkin Canal Water Quality Committee Chair			$5,000	Competition for grants. Matching funds are required. Grantors are reluctant to award grants that do not stop nutrients from entering the water.
	1.2.11 Install a pump between two canals as a pilot project to increase circulation.		Obtain a grant that will increase circulation in canals.		George Junkin Canal Water Quality Committee Chair			$20,000	
		1.2.12 Install more diffusers to eliminate fish kills.	Number of fish kills.	No fish kills.	George Junkin Canal Water Quality Committee Chair			$0	
	1.2.13 Develop ability to take more water quality measurements		Obtain additional monitors	Obtain an additional hand held and an additional continuous monitor.	George Junkin Canal Water Quality Committee Chair	U of D DNREC CIB		$5,000	Funding and locating sources to help
	1.2.1 4 Implement quantitative goals based on regional standards. The goal is currently to reduce nutrient inputs. This is being accomplished by raingardens etc. There is currently a slight shift in that now projects are being considered that actually improve the existing degraded water.		I DO NOT KNOW HOW TO DO THIS TASK Regional standards are not being met for nitrogen. Ground water is so saturated with nitrogen that it will be decades before nutrient levels caused by groundwater are eliminated.	I DO NOT KNOW HOW TO DO THIS TASK Regional standards are not being met for phosphorous. Soil is so saturated with Phosphorous that it will be years before nutrient levels caused storm water run off are eliminated.	George Junkin Canal Water Quality Committee Chair			0	