

WATER COMMITTEE
SEPTEMBER 22, 2010
MINUTES

<u>MEMBERS PRESENT:</u>	Pete Frisina, Chairman James K “Chip” Conner, Vice Chairman Tony Parrott
ABSENT:	Brian Cardoza Jack Krakeel
<u>NON-VOTING MEMBERS:</u>	David Jaeger
<u>STAFF PRESENT:</u>	Russell Ray
<u>GUEST:</u>	Stephen Hogan, PTCWASA

The meeting was called to order by Chairman Pete Frisina at 8:00 A.M.

I. APPROVAL OF MINUTES FROM THE MEETING ON SEPTEMBER 8, 2010.

Vice Chairman Chip Conner made the motion and Tony Parrott seconded, to approve the minutes from the meeting on September 8, 2010. There was no opposition.

II. LAKE MCINTOSH UPDATE.

David Jaeger reported that the contractor has been working on installation of the 60” diameter concrete pipe. The pipe ties in at the existing pump station, there will be a gate that will give the county the ability to lower the lake level if necessary. Chances are, that won’t happen, it also provides a conduit for low level release through the dam when the lake is full. The pipes are specially designed with a double O ring that allows for pressure testing of the joint while they put it in. They don’t have to do a hydro static test; it is a pneumatic pressure test at the joint. The joints are also designed to allow for extension of the pipe as the weight of dam, which is built above it, the weight compresses, and the pipe wants to extend.

The next photo showed the form work and installation of the concrete cradle around the pipe. It serves two purposes, number one – it provides support for the pipe and it also eliminates the need to back fill underneath the pipe which is very difficult. In a dam situation, you do not want crushed stone or any other type of aggregate under the pipe, because it can seep through the dam uncontrolled. Once they cured the concrete they began compaction of the fill around it.

Mr. Jaeger showed a slide on the erosion control. They have installed additional silt fence running up the haul road, between the haul road and the creek. They have done mulching between the haul road and along the shoulders. At each of the stream crossings they have added double row silt fence on the sides with an aggregate surface across it to protect the creek from any siltation. He then showed a

slide of the under cut material that was wasted within the reservoir bed. They are fairly large areas that have been ringed with earth berms, mulch berms, brush berms, as well as double row silt fence. That has all been grassed, as well, so that the disturbed area is reduced as we go forward, from an erosion control standpoint.

Mr. Jaeger said they will continue to place fill, they have to finish the under cut operation, which is essentially complete. Once they get the back fill over the pipe, they will route the creek back through it and then they will back fill the diversion channel. At that point, they will construct a surcharge fill area where they will build the fill up to the top of the dam height and let it compress the sub grade over time until it stops settling. There will be monitoring devices placed on the top of the fill pad so that the geo-tech folks can monitor it and then the settlement slows down to an acceptable point, they will then strip that back off and begin the actual construction of the actual dam.

Mr. Parrott asked what they will do while they are waiting. Mr. Jaeger said it is possible that they will have to demobilize, it depends on whether they can work on the abutment areas while that is being done. It is anticipated that it could be more than a month while the settlement plays out. Probably, they will work on the abutment areas outside the compression zone. This will probably be during the wet part of the winter.

Vice Chairman Conner asked about the additional cost for the erosion control. Mr. Jaeger replied around \$91,000.00. He said we had a visit from the EPD inspector yesterday and he seemed to be satisfied with what we have done.

Mr. Parrott reported they are continuing work on the wetland sites. The weather has cooperated with them. They have some stream diversion work to do.

III. TOTAL ORGANIC UPDATE.

Mr. Jaeger reported that the pilot study is complete for the total organic carbons. He did a presentation to summarize the results of the study. The primary objective of the study was to get improved removal of total organic carbon; also to help determine the relationship between total organic carbon and dissolved organic carbon content in the raw water supply. What we learned is that Fayette County's water system, while it has a fairly low TOC reading for raw water, the percentage that is actually dissolved organic is very high. He said that we suspected that, but this study confirmed it. That helps explain some of the difficulties we have in achieving minimum TOC removal because with your conventional coagulation and flocculation settlement, you get all the suspended particles, but the dissolved organics are harder to settle out. These technologies help attack the dissolved organics as well and improve your total TOC removal.

Mr. Jaeger went on to say that the last objective was to achieve reduction in disinfection byproducts in order to meet the 2012 Federal regulations, which will be

stricter than what we currently have to meet. We had two pilot programs, both at the South Fayette water plant. One was a magnetic ion exchange technology, known as MIEX, by Orica Watercare. The second one is a ballasted settlement using a sand particle to create a heavier floc particle which achieves better settlement and then in addition to that, powder activated carbon was added which attacks the dissolved organics. That is the Actiflow Carb system by Kruger. He showed a graph charting the results of the two processes with regard to total organic carbon removal, 35% is the minimum currently required by current regulations. The first bar on the chart is what was measured from the plants settled water, basically the water through the plant without any of these technologies during this pilot program. The plant was achieving right at or above the 35% removal of TOC. This was a sample taken by one of the companies; it was not actually the plant water, comparing it against the conventional settlement and coagulation that the plant is doing.

Mr. Jaeger said the second bar is the MIEX results, and they achieved an average of 66% removal, the highest of all of them. The next three bars are the Actiflow Carb pilot, it was run at various PAC dosages, the first being 30 parts of powder activated carbon, then 20, and then 10. As they reduced the powder activated carbon dosage, the TOC removal dropped. At 30 parts there was about 52% removal, at 20 it was about 50, and at 10 it is about 40. The last bar is results from a few years ago when we did a pilot at Filter number 7, at the Crosstown water plant. We replaced the anthracite with granular activated carbon and over a six month period, we achieved an average of about 54% TOC removal on that one filter. That shows the GAC is another option in addition to the MIEX or the Actiflow Carb processes. That would be replacing the anthracite in all the filters at the plant.

Mr. Jaeger stated that he will be talking about the Actiflow Carb at a 15 part dosage of PAC. He arrived at that by determining that the 10 part was a little bit too low for comfort. It did not give us enough cushion above the 35% minimum, he felt that we would be in the range that we could easily meet the TOC removal requirement and have some level of cushion. Another option for MIEX is to use MIEX on 50% of the water that goes through the plant, then blending that water back through with the normal plant water. In that case we would be looking at an average reduction of 66 and 35, we would then be somewhere in the 50% range, which would put it on par with the other technologies. Going into this, we felt we would want to treat all the water we could with whatever technology we used, but as we began to compare these and realized the MIEX process achieves the highest TOC removal, it also has the highest cost associated with installation. If we are willing to accept a lower TOC removal from Actiflow or GAC, we then open up the idea that we could use MIEX for 50% of the raw water flow and then run the other 50% through the traditional plant treatment and then blend them back together before through the filters. We would achieve as good TOC removal as the other technologies and reduce the initial capital and the operational cost with MIEX.

Mr. Jaeger explained that disinfection byproducts were measured by taking the effluent from the pilots, sending them to a UL lab in Indiana, at that point they were dosed with chlorine and incubated for a seven day period at 25 degrees Celsius. That is to simulate water that has been treated, chlorinated and put into your system and then seven days later, at some point out in your system; it has had time for the chlorine to be in contact with any remaining organics. That is what created disinfection byproducts. This simulates aged water in your system, and after the seven day period they tested for trihalomethanes and haloacetic acids which are disinfection byproducts that are federally regulated. 80 parts per billion is the maximum allowable presence of THMs, so we can see the plant control is in the 58 part range, MIEX had the lowest down around 25, and then the Actiflow rose as the dosage of the PAC was dropped. It ranged from about 39 up to 53; all of these are below the 80 part per billion number that we need to meet. The change in the future is that your sampling points no longer become an average, we have to sample at specific (worse case scenario) locations.

Mr. Ray stated that we have fixed sites and there will be an average of that site only, not an average for all the sites together.

Mr. Jaeger explained that when we ran the GAC in the filter at the Crosstown plant we did not send the water off for testing for disinfection byproducts, so we don't have data there. Data tends to follow the TOC removal, so he thinks it is safe to assume that if we are achieving 50 parts percent TOC removal with the GAC, the THM levels would be probably in the neighborhood of what the Actiflow Carb 30 range is, well below the 80 part maximum.

Mr. Jaeger said that there are similar results on the HAA5s, the maximum is 60. Currently the plant water is substantially below that. MIEX is way down around 12, Actiflow range does not exactly follow what you would expect. There may be some testing irregularities here, but at any rate, if you are looking at a 15 part Actiflow Carb, it may be in the range of 35 parts, still well below the 60 number. GAC was not tested for that.

Mr. Jaeger went on to say the next thing they looked at was cost. We are looking just at the South Fayette water plant, the plant is currently permitted at 6 MGD, and we are expecting to have it upgraded to a 9 MGD treatment capacity in the near future. He said he compared the capital cost on a 9 MGD installation at the South Fayette plant. Option 1 is to replace the anthracite with GAC in the filter, at a cost of about \$600,000. This is a one time cost to change these out. The life of the GAC is really unknown, as far as how long before we have to replace it; we are anticipating right now that it would be about a year, based on what happened at the Crosstown plant in Filter 7. The cost would be initial cost to swap it out, and to also purchase enough GAC for 7 filters (there are 6 filters), so that each time you have to trade out the anthracite you would have available right there to swap it out. Then, it would be staggered after that. These costs are based on the county entering an agreement with Calgon to essentially re-use our own GAC, we would send it back to

them, and they put it back through a furnace to reactivate it. Instead of buying virgin carbon every time, you are reusing your own, and there is about a 20% savings by doing that.

Mr. Jaeger estimated the annual operating cost at the average plant capacity which currently is about 4 MGD over the course of a year. It would cost \$600,000.00 initially to swap out the anthracite for GAC and then on an annual basis, we would be looking at \$420,000.00 to change and reactivate the carbon on a yearly basis. The one year period is an estimate; you cannot get the manufacturers to commit to a life span because it varies depending on your water chemistry and the configuration on the filters.

The second option is to use granular activated carbon after the filter, there would be a contacting vessel and water would have to be re-pumped through. You don't really save on the amount of carbon that you have to use; it is the same amount of carbon, because it is the same amount of contact time. The installation cost is much higher because you have to pay for and install the carbon contactors, you have some re-pumping costs, piping changes and so forth. So, you are looking at \$4.1 million for a GAC post filter contactor system. The GAC post filter annual cost is slightly lower because we are assuming that you get some benefit by running through the existing filter system. We anticipated there would be some slight reduction in the annual operating cost by extending the life of the GAC in the contactors versus the filters.

Item three is the MIEX system based on 9 MGD installation; that would be two 4 ½ MGD trains at a cost of \$5.4 million installation cost; that number includes the equipment, the initial resin to load the equipment, a brine recovery system which reduces your salt use and your brine waste; installation of all that, electrical and controls, some site work, and some contingency on top of that as well as piping modifications. Mr. Jaeger stated that the numbers he used for that were equipment numbers provided by MIEX and then estimates based on percentage of equipment cost that he got from contractors and electrical consultants in the range of 15%. He used the 10% contingency. MIEX stated that they felt that number was a little high, based on what they have seen for other installations, but they were not able to give him anything that was solid enough for him to change his percentages. He said he felt it would be best, at this early stage to stay with a number that he felt at least covered what we think it might cost. There is a chance that if we were to go with a 9 MGD MIEX system, it could come in below that on bid day. The annual operating costs for MIEX is about \$170,000.00; that covers the power cost, the resin recharging that takes place, as well as the disposal of the brine waste. There is no sewer system at the South Fayette plant, so it would have to be trucked and hauled. There are some cost savings that go into that number. MIEX and Actiflow allow for reduction in alum dosage, about 60% reduction, as well as a reduction in chlorine usage and lime; so, there are some chemical savings. In the Actiflow Carb system we also see some savings in elimination of some existing equipment.

Mr. Jaeger explained that the fourth item is Actiflow Carb; it is about \$3.4 million installation cost. It is also two 4 ½ MGD trains. He said they looked at a free standing installation, which would allow us to maintain and continue to use the existing sed basins. We could also retrofit the sed basins and put the Actiflow Carb within the basins; that would be about a \$375,000.00 savings below that number. He said he is reluctant to do that because you are sacrificing those sed basins when future regulations might come up, as well as extended detention time between these systems and the filters. If you have something that causes you to shut down the system right now, if you have the basin in between the filters you have a time cushion. The numbers are based on a free standing system, not retrofitting the sed basins. Actiflo Carb has a very similar operating cost as the MIEX, about \$170,000.00 a year. That is based on 15 parts of powder activated carbon, some sand loss and regeneration, power costs, etc.

The last option is to route half of the treated water through MIEX and the other half through the conventional plant, so that would drop your installation cost down. It would not be half, but it is substantially less than the whole 9 MGD capacity and your operating cost does drop about 50% as well.

Mr. Jaeger showed a graph with a 20 year projection of total cost for all five options. It includes the initial capital cost for construction, plus the operational cost. The operational cost with a 2.5% annual inflation applied to it. He said he did some research on line and found that currently the inflation is about 1.2%, it has been depressed because of the economy lately. He does not feel that it would be safe to anticipate that over a 20 year period. Calgon suggested using a 5% inflation rate for the cost of carbon, so he split the difference for his review and used 2.5%. It changes the total dollars; it really does not change the relationship between the technologies as far as the cost of one versus the other with respect to the inflation rate. On the graph, the purple line on the bottom is the GAC in the filters, it is the cheapest to install, so your initial cost is the lowest, but it is the most expensive each year to replenish it. Within nine to ten years, it crosses over the Actiflow and the 50% MIEX options and becomes expensive in the long term. The second line is the Actiflow Carb 15 part of PAC, that would be the second cheapest to install, it has a fairly reasonable annual operating cost. The third is the 50% MIEX line, it becomes the cheapest over time, even though there is a little bit higher installation cost, the operating cost of that becomes the cheapest when you compare over a 20 year period. Then the red line is the GAC post filter contactor and the blue line is the MIEX at full plant capacity. You can see the blue line and the gold line are sort of parallel because the operating costs are the same for those.

Mr. Jaeger said the MIEX system is a proprietary sole source vendor for the resin. He used 2.5% for all of these for annual inflation index, currently they have given him information saying that they would enter into a four year contract, which he would like to push out farther than that if they are willing to, if the county decides to go the direction of MIEX. That will greatly influence the overall cost for this, if they are anticipating a higher inflation rate or subject to their pricing after the

contract is expired without any other competitive source, that is something that we need to consider pretty thoroughly before we enter into any kind of agreement with them. He said he does not sense that they are doing anything but negotiating in good faith, but they are a sole source.

Vice Chairman Conner asked if there are other sources if something happened to MIEX, if they went belly up. Mr. Jaeger said he does not know the answer to that yet. He said they have had discussions about the fact that their resin is produced in Australia, and that they currently have stockpiles in the United States that covers all of their current installations for a one year period. They are strategically located, the largest one is in Savannah, and they have two others, in the West and Mid West. If there are any problems domestically with transport, they can get it from another stockpile area. He said he thinks they are also willing to pre-sell the resin, so you could buy and stockpile yourself. It does not have a short shelf life, so there is no issue there. As far as if they totally went under, what position that would leave the county in, he has to find that out.

Mr. Jaeger said since we would have to do this at both water plants, he expanded the capital and operating costs to cover both plants, based on Crosstown being permitted at 13.5 MGD and South Fayette anticipating the 9 MGD future permitting. These numbers are 2.5 times the original numbers and that is 22.5 MGD versus 9. On any of these going forward it is a substantial investment, both up front and annually to operate them.

Mr. Jaeger said that he anticipates to go from here is to further discuss the potential contract arrangements for supply of the resin with MIEX as well as the question about what happens if they were to completely go away. There is an Actiflow installation near Charlotte, North Carolina that he has been invited to visit. It is similar plant capacity. He said that we have also had that opportunity, and taken advantage of it with the MIEX installation in Alabama. He said we have seen one installation; we would like to see another one. There is a new Actiflow Carb installation being built in Indiana that will come on line, probably, first of the year.

Mr. Parrott stated that we do not have the money, so we will need to look at borrowing additional funds. The committee further discussed the installation of carbon and the process of keeping the plant on line while it is being reactivated. The plant in Indiana will be the first Actiflow Carb that will be built in the United States, they have some in Europe.

Mr. Jaeger explained that a short term measure would be to put GAC in the filters in order to meet the transition change deadline for the disinfection byproduct regulations. Obviously, we don't want to spend money that we don't have to. If there is a time element in getting funding, money could be spent to stay in compliance by using GAC in the filters.

Mr. Ray said that we have been meeting the criteria as an average, but he will be looking at the numbers for each individual site, in respect to the change in the regulations that are coming up in 2012. We are still meeting the TOC criteria, but there is a drop on the removal at Crosstown right now. He attributed this to the water changes; during the drought we had a higher quantity of dissolved carbon. Mr. Parrott commented that Lake Horton is 3 ½ feet low.

Mr. Jaeger stated that performance of the technology is not a question at this point. All of them will work, it is a matter of what can we afford to do, what is the best fit for our plant. Then there are the tangible things like sole source vendors, cost associated with the supply of the resin. Those things, we need to really become comfortable with before we move forward on this.

General discussion followed about the pilot test results, the availability for expansion at the water plant to accommodate the new technology if needed, installation time and the deadline to meet the new regulations.

IV. BROOKS WATER TANK.

Mr. Parrott explained that the water tank in downtown Brooks is located at the county recreation park. The Water System has leased this tank to Brooks, now the Water System is managing the Brooks system. He said that he has no interest in maintaining this tank; the maintenance is more than what the tank is worth. He said he wants to get the Board to terminate the lease with the Town of Brooks on the water tank and then take the water tank down. Years ago, the Town of Brooks had a 2,000 gallon pressure tank with a well, and it started getting pin holes in it. He talked with Alan Putnam, the mayor at the time, about doing some piping changes and they could use the elevated tank. We were not using it, because it would not work with our system, back then, much less now.

He said that the Town of Brooks did some piping changes. They were using it until a couple of years ago, then they quit using the well and started going off of our system pressure. Then they found that using the tank actually reduced the pressure in their system.

Mr. Parrott made a motion to recommend to the Board of Commissioners to cancel the lease agreement with the Town of Brooks for the water tank, and then to have a contractor take the tank down. Vice Chairman Chip Conner seconded and there was no opposition.

WATER BILL CHANGES

Mr. Parrott explained that as part of the update of our billing system we will be changing the bills. Any time we change the bills, we have to run it through the Board of Commissioners. He referenced copies of the bill changes in the committee packet. There is a regular water bill and a final water bill. The new bill will have a

bar graph showing what the usage was for the past thirteen months. With the Water Stewardship Act one of the water conservation measures is that they want us to be able to show customers what they have been doing. The bill also leaves room to have more than one account, more than one meter. The county is currently looking at a Stormwater Utility, and if that happens we could even bill on an annual or quarterly basis for stormwater charges. The back of the water bill lists the rates, including all four sewer companies.

Mr. Parrott commented that current average usage is almost 12 MGD; last September it was 8 ½ MGD. Lake Horton is down 3 ½ feet, Lake Kedron is down 2 ½ feet.

There being no further business, Chairman Pete Frisina adjourned the meeting at 9:05 A.M.

Peter A. Frisina

The foregoing minutes were approved at the regular Water Committee meeting on the 13th day of October, 2010.

Lisa Quick