

Barr Lake/Milton Reservoir Watershed Association

Technical Committee Meeting
Thursday, July 25th, 2013 (9:00am – 11:00pm)
Metro Wastewater Reclamation District, Denver

Draft MINUTES

In attendance:

Steve Lundt – Metro Wastewater
Laurie Rink –FRICO (phone)
Jim Dorsch – Metro Wastewater
Linda Chynoweth – Aurora
Shelley Stanley – BDCWA
James Boswell – Thornton
Julie Kinsey – EPA
Al Baker – Centennial

John Hendrick - Centennial

Guests:

Amy Conklin – BMW
Marcia Greenblat – Integral (phone)
Ken Wagner – WRS(phone)
Nicole Muell – Brownstein, Hyatt, Farber and Schreck

Steve welcomed the group and they approved the June 27th meeting minutes.

Steve reported on the Lower Bear Creek Watershed Plan meeting he attended. Their watershed is a sub-watershed of the BMW watershed. It has a large agricultural component. They are beginning to collect data from outfalls and tributaries. They will be sampling twice a month for four months. They have detected e coli in every sample, every time. Steve encouraged them to include adding nutrients to their sampling protocols. We need to make sure that their BMPs are consistent with ours.

1. BMW WQ Modeling Update

a. Task 1 and 2 Updates and next steps

Marcia Greenblatt reported that the model has been updated and they are working with Ken to refine the relationships. She **will put together a brief summary of the modeling effort for next month**. The group discussed the modeling scenarios. After we understand the modeling effort in more depth, we can review the scenarios we want modeling. The next meeting will be August 22nd. Marcia will coordinate with Ken.

Ken Wagner reported on the memo he sent on his findings. Phosphorus (P) is not currently limiting algae growth. There is a relationship between chlorophyll (chlor) and pH but no relationship between Phosphorus and pH because P is not yet limiting. His finding is that 20 ug/L is the max amount of chlor we could have and still attain the pH standard. In Milton the amount of chlor may be even less, in the neighborhood of 9 ug/L, because the pH coming into Milton is higher than the water coming into Barr. It will take a lot of P removal to get the system down to a P limited scenario. Steve clarified that even with low chlor the pH can exceed the 9.0 standard. Under current water quality conditions, we'll have to reduce the H⁺ ion concentration in ½ to attain the standard. Since our initial guess was chlor at 25ug/L to attain the standard, now we've just refined it to 20 ug/L in Barr Lake. The lower we make the alkalinity, the lower the pH. Mixing may work to reduce the pH because it will help the transfer of CO₂ into the water and reduce the alkalinity. CO₂ acts as an acid in the Barr and Milton systems. Adding alum also reduces alkalinity, leveraging the reduction in photosynthesis (and hence in pH), caused by removing P.

The mixing system would have to be very powerful to counteract the energy being put into the system by the sun.

John Hendrick asked how the findings drive what we do in-lake. Steve responded that he has a list of options. There is no silver bullet, but there we may be successful with a (silver) shotgun approach. He asked what we expect to happen to improve the ecology by removing pH with the answer being, we don't know yet.

Ken reported that he is pretty much done with Task 2 and we can work on Task 3 in August.

2. In-Reservoir Implementation Options

- a. Begin possible list of general options to investigate
- b. Fishery Management (Paul Winkle)

Steve presented a list of 18 management options for Lakes and Reservoirs. He had hoped we could talk to Paul Winkle about **bio manipulation** but he was unable to attend. Usually it's a trial and error process to get to the goal situation. Steve wants to explore options for managing carp that stir up sediments, releasing nutrients. We may want to include a fish screen as a management tool. Alum treatment can be ineffective where the carp are actively churning up sediments.

Artificial Circulation, Aeration, Chemical Sediment Treatment and dredging are options we can consider. Before we consider dredging, we should consider P concentrations in the sediments. There may be some water rights complications with dredging. Shelley asked how much water in Milton comes from Barr and how much from the SPR with the answer that 70% to 80% of the water reaching Milton comes from SPR. The water coming out of Barr is of better quality than that coming out of the SPR, so there could be some **dilution** by using more water from Barr to go to Milton. Feb. 2012 was the last time Metro pumped effluent into the Burlington Canal. Manipulating what water is in the Burlington is another management tool. Any options that focus on weed removal are not appropriate. **Alum** addition is an option to consider. **Partitioning** of parts of the lake with wetlands or other options may work for our system. **Rules and Regulations** on human actions to minimize impacts is another option to consider as ammunition for our shotgun.

Steve is hoping that as a committee we can narrow the treatment to just 3 or 4 options, that should save us some time and money in the future. Linda Chynoweth reminded the group that we may have to consider implementation of several management options at once. John Hendrick suggested we consider the combination of partitioning a forebay to control carp coming entering Barr Lake in combination with in-lake treatments. Steve will take the list, rank it based on our conversation and send it out to the group. The results of the committee ranking the management options will help with developing a long term budget and then identifying funding for the options. Laurie clarified that BMW is unlikely to be responsible for implementing the management options but is responsible for coming up with costs and feasibility studies for the different options.

3. In-Canal Treatment Scope of Work Overview

- a. Tetra Tech – Harry Gibbons
- b. Environmental Research & Design (ERD) – Harvey Harper
- c. Develop a selection committee and selection process

Ken Wagner shared his opinion that either of the firms would be a good choice. He'll look at their proposals and make a recommendation. Steve went over the two options submitted. The ERD proposal would be cheaper and treat the water in the canal with floc migrating into the lake. Injecting alum would require slowing the water down to allow the alum floc to settle out. There is a benefit of letting the alum migrate into the lake. There may be some regulatory complications to alum going into the lake. The group asked about the sustainability of treating water in the canal and

any water rights implications. There are no water rights complications with floc settling in the lake because the floc doesn't create an impenetrable barrier. The issue is that sediment forms on top of the floc and the nutrients are then available again. The treatment period would only be when the lake was being filled. We would need to develop an estimate for how much floc would accumulate and identify any capacity issues caused by the floc reducing storage space in the lake.

John commented that maybe we don't need to treat all the water in the canal but only a slipstream. In addition, if we could partition off a forebay and/or wetland, then collecting the floc and other materials would be that much easier. He wonders how we can explore those options. Neither proposal addressed those specifics about treating only part of the canal water and/or creating some sort of partition in the lake.

Steve asked how we should proceed in selecting a proposal. Shelley commented that she reviewed their project examples and concluded that Tetra Tech had less experience than ERD. Linda agreed that she preferred the ERD proposal. ERD is an engineering proposal rather than working with nature. Laurie also concluded ERD would be the best option. ERD seems ready to start treatment. Tetra Tech would be more valuable if we had the luxury of considering lots of options. The fill time for Barr is typically in the winter but it is filling to some degree 9 to 10 months of the year. The bulk of the filling happens in the winter which limits the effectiveness of the wetlands. Wetlands required for adequate polishing would be almost as large as Barr Lake. John agreed that we should continue to be open to options that work with nature, such as wetlands, but they are of limited use for us. He questioned the inclusion of a hydrology assessment by Tetra Tech. Steve commented that they probably just weren't familiar with what we've already done. While Tetra Tech could provide us with excellent limnological evaluations, we already have Ken Wagner. The group also liked that the ERD approach would result in a project we could immediately start implementing and the fact that the ERD proposal was \$30,000 cheaper.

A straw poll showed that the ERD proposal was a unanimous choice. Laurie leaned towards the ERD proposal but the FRICO manager leaned towards Tetra Tech. FRICO liked the consideration of different options. She reminded the group that we can negotiate the scope of the work with whoever we select. Steve will make a recommendation to the Board to hire ERD and ask for the Board to allow Steve to develop a more specific scope of work not to exceed a certain amount. The biggest difference between the 2 proposals is that the Tetra Tech has a lot more time and money allocated for exploring options for treatment. The group concluded that examination of alternatives has pretty much already been done and our realistic options are limited (to probably alum trickle and wetlands). Tetra Tech would produce an excellent report but ERD will produce an action plan.

4. Limnocorral Update

- a. Curry Design sending corner patches
- b. Plan for next year

Steve updated the group on the patches for the corners of the limnocorrals. The patches are not 100% water tight; there is still a little seepage. He also applied the alum again. Then he sampled the next day. The fix seems to be working. We should be able to continue sampling through the month of August even though the lake is getting lower. However, the metal frame connections have all come off and will need to be repaired. James asked if there is any research that evaluates the benefits of in-canal versus in-lake treatment. Steve responded that in most cases, in-lake treatment is tried first, however, in our situation the water only stays in the lake about 8 months. So, the lake management, the short residence time, is driving our need to do both in-canal and in-lake treatment. Julie Kinsey validated that we'll need both in-canal and in-lake treatment. The internal loading of P from the sediments will require that we do some sort of in-lake treatment to reduce the internal loading. The carp control may work as an in-lake treatment. James's question is can we attain the

P standards with just an alum treatment (whether in-lake, in canal or both) with the answer being yes but it's just a band aid and would have to be repeated often. Alum treats the symptoms, not the cause.

5. WQ Updates

a. Milton Reservoir Water Clarity

Steve reported that with 800 ug/L of P in Milton, there were 4 meters of clarity (our of 5). Today the clarity is only 2.5 meters. It was the clearest Milton has ever been in July. He is suspicious of carp and zooplankton but that wouldn't explain why blue green algae wouldn't be growing. Barr Lake is still about 7m deep, out of 10 but it is draining and will drain faster in August.

6. TMDL Implementation Topics (On Going Updates as Needed)

- a. Canal Treatment
- b. Stormwater Options
- c. NPS/Ag.
- d. WWTP upgrades
- e. In-reservoir Options

Linda asked what the requirements of the TMDL are for implementation. In five years we need to be able to report on our progress in meeting the target concentration. Will there be another regulatory process? Julie replied that, no, there will just an addendum to the TMDL which could include changing the targets. We would submit the addendum to the TMDL to the CDPHE with review and approval by EPA. EPA doesn't have a lot of rules about the process of implementing a phased TMDL. If we don't change the targets we should still submit a report on what we're doing for documentation purposes.

7. Next Meeting

- a. Tech. Committee: **August 22, 9:00am to 11:00am at Metro**