

## Barr Lake/Milton Reservoir Watershed Association

### Technical Committee Meeting

Thursday, February 27<sup>th</sup>, 2014 (9:00am – 11:00pm)

Metro Wastewater Reclamation District, Denver

## Draft MINUTES

### In attendance:

Steve Lundt – Metro Wastewater

Laurie Rink –FRICO (phone)

Jim Doersch – Metro Wastewater

Shelley Stanley – BDCWA

Jordan Parman – Metro

Julie Kinsey - EPA

James Boswell - Thornton

John Hendrick – Centennial

Al Baker – Centennial

Al Polonsky – Denver Environmental Health

### Guests:

Amy Conklin – BMW

Nicole Muell – Brownstein Hyatt

Marcia Greenblatt – Integral

Sarah Barbudo – Integral (phone)

Harvey Harper – ERD (phone)

The group introduced themselves. Steve noted that this was our first meeting since November.

### **1. Modeling Scenario Results (Marcia)**

- a. Overview of project – Marcia explained the updates and expansion to the model. She explained the SWAT model is the watershed modeled and it is coupled with the WASP, in-lake model. They found that the original SWAT model is pretty well calibrated. There was more calibration of the WASP model than the SWAT. They reviewed several of the model parameters focusing on the benthic flux (release rate of TP from the sediments). They also looked at the solids partitioning coefficients and phytoplankton settling rates.

It was asked if the model could vary the DO seasonally by modifying DO concentrations and the number of days of low DO. It was also asked if there could be a sensitivity analysis with the response being that a full sensitivity analysis was not done as part of this effort but it was completed as part of the original modeling.

Marcia showed multiple graphs comparing actual data and model output for Barr and Milton. Milton shows a closer correlation for TN than Barr Lake. The group asked about the variances between measured and modeled especially for TP in Barr in 2007, the model generally underpredicts TP concentrations. In summary, the model update and recalibration showed that the model captures general trends and the range of data, the parameters are more realistic, and this supports using the model to predict future conditions.

There are still a lot of unknowns in the system which could impact the management scenarios. Marcia cautioned that the management scenarios are intended to be more of a relative measure rather than a completely predictive tool. It should help us decide which type of treatment to try rather than the levels each treatment will achieve.

- b. Scenario Results – Marcia explained the 3 scenarios that were modeled:
  - 1. Assume the Wasteload Allocations from the TMDLs are met
  - 2. Assume in-canal treatment at 2 levels
  - 3. Assume a combination of both.

There was a discussion about adjustments to flow regimes now that Metro will be discharging less frequently into the Burlington Canal. Both predicted future pumping rates of Metro's effluent and historical flows were modeled. In-canal treatment levels were assumed at 2 levels, removal of 2,269 kg/yr of TP and 14,500 kg/yr of TP removal.

Marcia showed a comparison of the management scenarios for just POTW compliance combined with in-canal treatment at 2,296 kg/yr and using future predicted pumping flow from Metro. The results show that the removal of TP from POTW effluent is by far the more effective way to reduce in-lake TP concentrations.

It may be best to wait to see what the impacts in-lake are from POTW nutrient reduction before deciding on whether to implement in-canal treatment. It may also be appropriate to revisit the target goals in the TMDL post POTW implementation. The results for Milton were similar to those for Barr.

- c. Final Steps – The modeling effort is almost complete. We just need to review the memos on the results. We may want to contract for modeling more management scenarios assuming more in-canal treatment. The consensus is to wait to see what ERD's results show is a feasible in-canal treatment removal rate. We may want to add a plot of the results of the management scenarios on pH and DO. However, the prediction of pH and DO will only be as accurate as the model calibration.

## 2. In-Canal Treatment Update (Harvey)

- a. Update – Harvey updated the group on the status of work completed to date. He found the site visit very helpful. It made the flow regimes very clear. He completed the jar testing. The samples were very responsive to alum addition. At about 6 mg/L alum addition, most of the TP was removed. The results were better than they usually see with agriculture flows. The pH of the raw sample was around 8 and didn't go down much as they added alum. He would prefer to see the pH drop to closer to 7 to be sure the dissolved Al levels are low. He predicts that we may want to go to a higher dose of Alum to keep dissolved Al low. Steve noted that in the limnocorrals, dissolved Al has been an issue.

The jar test showed that the floc settled out very quickly. ERD will be measuring floc settling rate in the next set of jar testing. He's guessing that all the floc settles out in about 30 minutes. It was asked if there was a way to reduce pH. Reducing pH may be achieved by adding a little more alum. He will explore increasing the dose of Alum until the desired pH is achieved. It was noted that the Suspended Reactive Phosphorus was unusually low. The N:P ratio increases with alum addition.

- b. Next steps – We need to get the state permit staff involved. Laurie Rink commented that she intended to invite permitting staff to attend any meetings where Harvey is making a presentation. It's still premature to be considering a permit for the in canal system, but we definitely need to make sure the permitting staff is well informed before we consider a

permit application. In the permit for the limnocorrals, the permitting staff has been concerned with dissolved Al.

### 3. Carp Removal Plan

Steve presented information on collecting baseline carp population estimates. The cost of nets to survey the carp would be around \$2,500. Steve noted that Milton was totally drained and all the carp were removed a few years ago. Steve has observed that the water in Milton has been much clearer since the carp were removed. The purpose of the survey is to estimate the population density of carp/hectar before removal, to correlate changes in population over time with observed water quality changes to arrive at a management level that benefits water quality while maintaining a carp fisheries. At a minimum it would be useful to know the amount of TP in a typical carp. Then we could estimate the amount TP removed with the carp. The bioturbation caused by the carp can also interfere with the benthic flux benefits from the alum floc. They can stir up the sediments, negating the benefits of alum floc in the sediment. Currently, there isn't good information about carp in Barr Lake. Removal of the carp should also increase the quality of the fishery.

Laurie asked if the nets could also be used for carp removal. The answer is no, because the removal nets are more like a seine; they form a fence and collect all the fish. The nets can be used multiple times. She also asked about his confidence in this type of net, a Fyke Trap Net. Jordan has done considerable research into different types of nets and they are reasonably confident that these are the appropriate nets for our mark and recapture population estimation. will meet with Paul Winkle, Co. Parks and Wildlife to see what type of nets he's used. We could also remove carp with electro shocking.

Steve has considered reel surveys and consulting with the carp bow hunters but that information wouldn't provide an adequate estimate. If we try to conduct a carp collection, it will be in April. Both Laurie and John Hendrick are in support of purchasing the nets. Due to mercury concerns, we can't give the fish away for human consumption. They will be composted.

### 4. Limnocorrals

Update, \$7,424 for 4 corrals – The price for the corrals is at cost. The Board approved the expenditure. Steve will be ordering them soon. Prior to installation, jar testing will be conducted to address Al concerns, dosing will be at higher levels. Meeting Al and DO water quality standards in the limnocorrals continues to be an issue so we'll continue working with permitting staff.

### 5. 2013 WQ Summary

WQ Graphs- Steve showed graphs of water quality parameters for Barr and Milton in 2013. Both Barr and Milton follow a bell curve for temperature, both lakes meet the acute and chronic temperature. Both lakes also met the pH standard. Unfortunately, we don't understand precisely why the pH standard was met though it was apparent that the September floods benefited the lakes. Neither lake met the DO standard in 2013. If the DO goes below 5 mg/L even once the standard is not achieved. TP in Barr spiked in August. This may be caused by carp turbation. The N:P ratios were also graphed and the ratio went above 20:1 in April and March. Chl a was below 20 in Barr in May and June but increased in June and July. Milton's Chl a remained below 20 for almost all of the growing season.

The long term trends show Chl a decreasing over time. Steve also graphed N:P to Chl a to show the correlation of when the ratio is above about 20, the Chl a values decrease.

Even if we continue to meet pH and DO standards, we will still need to meet TP and TN standards. It may be appropriate to consider site-specific standards if we just can't achieve the standards currently in place. We may need to consider if the beneficial uses are being met and if there needs to be a Use Attainability Analysis and, maybe site specific standards in a Control Regulation. Julie Kinsey thinks there may be a good argument to adopt more site specific standards as long as the beneficial uses are being met. John Hendrick reminded the group that the TMDL is phased and adaptive in anticipation of the reality that the standards currently adopted may not be appropriate. In summary – we are awesome!

## **6. TMDL Implementation**

Engage MS4 and NPS – The Board is working on completing action items in the Implementation Plan and has formed sub-groups to work on issues as shown below.

**(reminder: TMDL Implementation Topics to work on)**

- a. Canal Treatment
- b. Stormwater Options – Laurie Rink is leading this group
- c. NPS/Ag. – Shelley Stanley is leading this group
- d. WWTP upgrades – Sarah Reeves is leading this group
- e. In-reservoir Options

## **7. Next Meeting**

- a. Tech. Committee: April 24th, 9:00am to 11:00am at Metro