

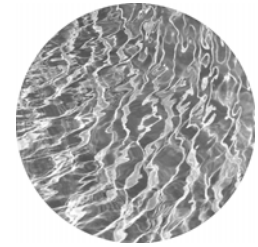
Barr Lake/Milton Reservoir Watershed Association

2008 Technical Committee Meeting Minutes

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Barr/Milton Watershed Association

Technical Committee



BMW Technical Committee/Watershed Plan Committee Thursday, January 24, 2008 Metro Wastewater Reclamation District, Administration Building 9:30am – 12:00pm
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Committee Notes

Attendance

Steve Lundt (Metro)

Laurie Rink (FRICO)

Joni Nuttle (CDPHE)

Darcie Garland-Renn (Integral)

Ken Heim (ENSR)

1. Reservoir Assessment Update

Milton flow data is finished and Laurie Rink had a hard copy. The time period of the data is from 1968 to 2004. Laurie also had some additional water quality data from Central Colorado Water Conservation District. Laurie will e-mail the Milton flow data to Jean Marie Boyer and to Steve Lundt. Steve will pass on the flow data to Ken H.

2. Modeling Update

Ken H. called in to update the group on the model. All water quality data for the 20 point sources is ready and he plans to run the model this week. Ken has been working with the Arc-SWAT creator who has built the transfer system to GIS about our modeling project.

Ken will need 40-60 minutes at the workshop to talk about the building, calibration, assumptions, and results output. Ken will go over a sensitivity analysis of the model. There are lots of point sources and data gaps to talk about. Ken will also show some in-reservoir modeling results from SWAT. Steve Lundt will contact Ken Wagner to see how much time he needs to talk about the in-reservoir modeling efforts. Then committee went over the list of items the BMW board wants to see covered at the workshop and they are: go over the assumptions (how did you come up with them and how conservative were you in making them), summary of major data gaps, calibration and sensitivity analysis, in-reservoir results, help with giving direction on doing the scenarios at the next workshop, and answer general audience questions (e.g. why calibrate with 2002 and 2003 data sets?).

It was also agreed that it would be a good idea to also do more of a hands on session with those who want to know more about the actual SWAT model. The initial plan was to do a 2-3 hour hands on the day after in the Metro computer training room, but after the meeting it was decided to keep it to a 1-2 hour show and tell in the board room on the same day. It would be best to keep it to one day to stay within the scope of work. The final task is to have a hands-on training session. For the running of the model, Ken H. will need ArcGIS 9.1 and Spatial Analysis to run the ARC-SWAT model.

Steve Lundt proposed to set up a meeting with Dave Pillard to talk about the overall progress of the contract and see if there needs to be any adjustments made. Darcie agreed to arrange this meeting for February 26th.

3. Database Update

Ken H. was asked before hanging up if he needed an updated 2008 water quality database and he said no.

Darcie passed out a tech memo that summarized the database concerns and issues and how to move forward with managing it. The plan for QA/QC now is to have Steve digitally download each entities data from the database and send it on to the data owner with a form to sign off that states that they agree with their data. Steve will download each of the 21 sources and use the SPCURE sign off form to come up with one for BMW database.

The tech committee asked Integral to scope for 2008 a data management approach to transition to the DataSharing Network and how to QA/QC the data.

4. Technical Committee Wish List for Upcoming Coordinator Contract

Steve Lundt summarized the list that was discussed at the board meeting earlier that week. Integral will also scope the work to do a third party peer review of the model. This will need to be done sooner than later, by the end of April. Basically the review will be of the first 11 tasks that ENSR has completed.

The other major task is for the Technical Committee to figure out the process to begin developing the pH TMDL. Joni Nuttle stated that the BMW association will need to include the state on this so that a certain format is used that includes an implementation plan.

5. Watershed Plan

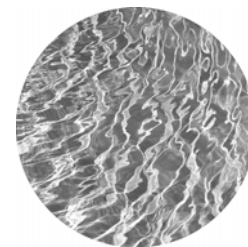
The state of the watershed will be finalized and ready for the Metro printers by the week of February 4th. It was decided that 2008 will be a big year to update the plan so the committee needs to meet separately and have a regular schedule. The plan is to meet on the 2nd Thursdays of the month starting on March 13th.

Integral drafted a memo about the updates for 2008 and Laurie Rink suggested changing it to be the cover letter for the state of the watershed that will be handed out at the February stakeholder meeting.

It was also decided to announce at the end of the stakeholder meeting this coming efforts to do an update in 2008 and to heavily recruit new members to the committee.

Barr/Milton Watershed Association

Technical Committee



BMW Technical Committee
 Thursday, March 20, 2008
 Metro Wastewater Reclamation District, Administration Building
 10:00am – 12:00pm

Committee Notes

Attendance

Steve Lundt (Metro)	Todd Harris (Metro)	Joni Nuttle (CDPHE)
Darcie Garland-Renn (Integral)	Ken Heim (ENSR)	Ken Wagner (ENSR)
Kelly DiNatale (United Water)		

1. Reservoir Assessment Update

The final drafts should be ready by April 15th. Hydrosphere is concerns that it will go over \$5,800 to finalize both assessments. The goal is to have no delays.

2. Modeling Update

Ken Heim talked about the issue with flows from April to June of 2003. The predicted volume of Barr gets close to 60,000 a-f. The large snow storm of 2003 was discussed. Kelly DiNatale suggested checking the model to make sure it is not treating the snow accumulation as actual precipitation. Ken Heim will check to see how the model is handling the snow accumulation. If it thinks 20 inches of snow is 20 inches of rain, then it would be over-estimating the runoff from the subwatersheds to the Burlington ditch. Ken Heim also split the agricultural land use out between corn and alfalfa. Kelly DiNatale also suggested using exact crop types based on 2001 or 2005 maps of crop type and irrigated acreage that is available. After the flows have been fixed, then Ken Heim will work on the nutrient calibrations.

Ken Wagner then spoke about using WASP as the in-reservoir model and the need to link the model predictions to pH. WASP does not predict pH so additional mathematical model needs to be developed to link the results to pH. Ken Wagner did linear regression of chl-a vs pH for Barr and there seems to be a good relationship. It seems with a 95% confidence interval, about 20-25 ug/L or less of chl-a would keep the reservoir below pH of 9.0. This considers surface pH values, log of the chl-a, and a leg time.

For Milton, it is not a simple linear regression. More parameters needed to be included to be able to better predict pH on a linear regression. Reasons for this lack of a clear relationship are: data not good, chl-a changes very quickly, large flushing, input waters high in pH, chl-a/TP relationship not good, impacts from agriculture or groundwater. Steve said that he trusts the chl-a data since he has filtered all of them and have see first-hand the conditions that change so drastically in Milton. The next step is to consider inflows, temperature, and a different time scale (monthly).

WASP's next version will include a pH module from EPA region 4. This will not be out for a few more months but it is something to keep in mind in the future. ENSR still doesn't think CE-QUAL-W2 would do much better since it does not directly predict pH. This 2-d model

predicts other parameters and then those results are used to calculate pH, very similar to what Ken Wagner has done.

Joni Nuttle did comment that she is concerned about all the emphasis on agriculture and calculating crop type and irrigation practices down to the acreage when urban impacts seem to be the driving force.

3. 3rd party Modeling Review

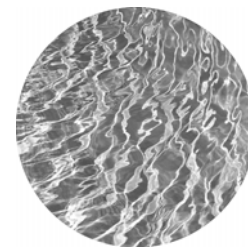
The committee discussed the current scope of work from Integral and other possible options. Laurie Rink e-mailed here idea to hold off for now. With the recent budget committee review, there is only about \$24,000 for a model review, not the original \$54,000. The original plan was that modeling would be done by engineers and additional money would need to be spent on a limnologist for review of the model. Since we selected ENSR because of the combination of lead limnologist and a modeler, we don't need to spend as much on a review. Also, Laurie stated that most of the board members will be review the modeling and that it might be best to wait for a 3 party review until we get everyone's comments back. So the committee recommendation is to hold off on the third party review, still do one, but wait a couple of months to see how the scenarios and workshop 3 go. A review can still be done late this summer and the model will not be released until the review has been completed.

4. TMDL development Plan

Ideas about how to begin planning for the third party TMDL development were discussed. Todd Harris suggested that ENSR might be a good candidate to roll into the TMDL development since they will be most familiar with the modeling results and loading estimates. Steve Lundt stated that he will e-mail the full committee to get everyone thinking about how to begin this process.

Barr/Milton Watershed Association

Technical Committee



BMW Technical Committee
 Thursday, April 24, 2008
 Metro Wastewater Reclamation District, Administration Building
 10:00am – 12:00pm

Committee Notes

Attendance

Steve Lundt (Metro)
 Ken Heim (ENSR)

Todd Harris (Metro)
 Linda Boyle (Aurora)

Darcie Garland-Renn (Integral)

1. Reservoir Assessment Update

Assessments will be done within the week. The plan is to e-mail the assessments to the Technical committee and ENSR to make sure there are no major problems. Then send the assessments out to everyone else. Ken H. will check assessments with the modeling results.

2. Modeling Update

Ken H. gave an update over the phone. The SWAT watershed model is almost completely calibrated. Additional code needed to be written to account for nutrients being diverted. Also took the average effluent TP instead of the daily numbers. Next step is to link the SWAT model to the WASP model. There will be a single file linkage between to the two models.

The plan is to send both Ken's the list of base scenarios that the board agrees on so that they can run the model before the third workshop. At the workshop, the audience will help build more specific scenarios based on the base scenario results.

Ken H. will send data files that will help with making a figure that shows where water and nutrients go in the watershed.

3. 3rd party TMDL Development

The Tech committee talked about possible options for doing a TMDL. One clear option that was discussed was to have ENSR carry on the efforts and to help with the TMDL. Budgeting for this task needs to be discussed with the budget committee. The other important piece is that the state needs to be closely involved with this task. It was decided to not come up with a recommendation but to have it be a major item on the next board meeting.

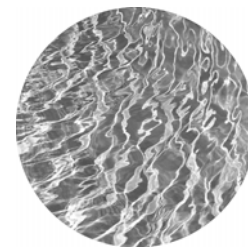
4. QA/QC of the Database

Steve will check one more time with Jim D. about the letter that accompanies the data dump. Steve L. will download each set of data and have then sent off for approval.

For the next agenda, will need to add what future projects the technical committee will want to do so it can be in the long-term budget.

Barr/Milton Watershed Association

Technical Committee



BMW Technical Committee

Thursday, May 29 and conference call on June 2nd, 2008

Metro Wastewater Reclamation District, Administration Building

10:00am – 12:00pm

Committee Notes

Attendance

Steve Lundt (Metro, call & meeting)

Darcie Garland-Renn (Integral, call & meeting)

Ken Heim (ENSR, call & meeting)

Laurie Rink (FRICO, call and meeting)

Joni Nuttle (CDPHE, call and meeting)

Chris Piper (Denver Water, meeting)

Todd Harris (Metro, call)

Kelly DiNatale (CDM, meeting)

Linda Boyle (Aurora, call and meeting)

Matt Malone (DRCOG, meeting)

Tammy Allan (CDPHE, meeting)

Ken Wagner (ENSR, call)

1. Reservoir Assessment Update

They are complete and have been sent around to the committee, modeling consultants, and the BMW board. Metro hired Bill Lewis to peer review the modeling and has also provided comments on the reservoir assessments. Bill Lewis' comments did not raise any major concerns and mostly agreed with Hydrosphere's remarks and conclusions. He added a few theories or suggested of his own based on the information he gathered from the reports that helped. It was suggested by Kelly DiNatale to get the final assessments from Hydrosphere in Word format so that it can be easily used for other documents. Kelly stated that Hydrosphere should not have a problem with it since they have provided securely locked final PDF reports that can't be changed. Kelly also suggested getting all the graphs and tables and spreadsheets that Hydrosphere used.

2. Modeling Update

Ken Heim gave an update on where he is with merging SWAT and WASP together and the calibration of both models. WASP reservoir model is being calibrated with 2002-03 data. Nutrients are tracking well but the chl-a is not. Chl-a data is highly variable during the summer that the model can't track and since the model only handles one species (B-G) of algae, it is predicting no chl-a during the colder months but in reality we have large diatom blooms. Ken H. said that he is waiting to get an updated beta version of WASP that can handle multiple algae species. This should help some with predicting chl-a. Joni Nuttle had many questions for Ken H. Mainly can ENSR calculate or predict what the allowable loading is for nutrients at barr and Milton at the current time. Ken H. said yes but the numbers would be most likely wrong because of the calibration problems. Joni asked if WASP could be run alone to predict allowable load. Ken H. said yes but you need to give it the data that the SWAT model will be doing. Joni asked if Ken H. could use the models to back calculate what the allowable load would be at given in-lake concentrations. Ken said that these dynamic, complex models are exclusively used to calculate concentration based on loadings. Ken H. suggested that we use Ken W. simple, spreadsheet formulas to predict allowable loads while they continue to finish up the calibration of the models. Ken H. felt that the watershed model is not see as a valuable tool and that all the State wants to know is what is happening in the reservoir. Ken H. see the

SWAT model as the more valuable tool when it comes to implementation and calculate of allocations. The BMW group agreed to this. Joni N. stated that the Division is concerned about the NPS budget and where the model contract is going and want to get allowable load numbers now before something goes wrong with the modeling contract. It was decided that a conference call with Ken W. was in order and Steve L. agreed to set up a conference call for the following week to talk more about what can be done now to calculate allowable loads.

3. 3rd party TMDL Development

Steve Lundt updated the committee about what the BMW board decided at the May board meeting. Basically, Joni N. will provide good examples of TMDLs and send an outline of the TMDL so that the BMW group can see how much work it is and how much they have already done for it. The plan is to wait until ENSR hands in their final report, read over it, and then decide if it would be good to continue with ENSR to do the Third party TMDL. This would all start in January of 2009.

4. QA/QC of the Database

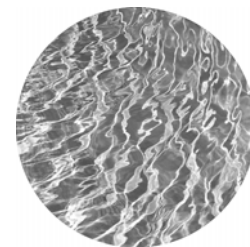
Steve Lundt exported all data for each data source and sent them to Darcie who will draft up a letter that will accompany the datasets. The letter will ask each data source to sign up that their data looks fine.

June 2, 2008 conference call

Ken W. agreed that he could use the handful of empirical, simple models to calculate allowable loads but it would be just a starting point to then use the SWAT/WASP model to finalize the loads. Laurie Rink asked if it would make sense to have Ken W. do this work even though the models will be calibrated and working soon. Why do empirical modeling that provides just a starting point when we got the modeling tools coming soon? Ken W. stated several times that all the models will be predicting conditions outside of the range of actual data and this is always a risk. Steve Lundt said that he has actual zooplankton data that might help better with the grazing impacts for the reservoir model and would send that data to Ken W. and Ken H. Ken W. said that you can use steady-state models to ask “what would it take to stay under pH of 9.0”. But this will give you an annual number when in fact season or monthly numbers seem to be a better way to go. Ken W. talked about the problems with calibrating chl-a. Ken W. will look at nutrients vs pH to see if there is a better correlation. Ken H. will be getting the updated WASP model within the week and begin working with it. Ken W. agreed that the number one question to answer is what are the allowable nutrient loads. Ken W. also agreed to do the empirical models at the same time the dynamic models are being calibrated. He does this anyways as a reality check.

Barr/Milton Watershed Association

Technical Committee



BMW Technical Committee Thursday, June 26 Metro Wastewater Reclamation District, Administration Building 10:00am – 12:00pm

Committee Notes

Attendance

Steve Lundt (Metro, call & meeting)	Todd Harris (Metro, call)
Darcie Garland-Renn (Integral, call & meeting)	Kelly DiNatale (CDM, meeting)
Ken Heim (ENSR, call & meeting)	Linda Boyle (Aurora, call and meeting)
Laurie Rink (FRICO, call and meeting)	Joni Nuttle (CDPHE, call and meeting)
Tammy Allan (CDPHE, meeting)	Chris Piper (Denver Water, meeting)

1. Water Quality Modeling

Ken H. stated that he received the new beta version of the WASP model. This newer version can model 3 species of algae, has enhanced eutrophication modules, and will calibrate it. This newer version is one dimensional and Ken H. did receive the zooplankton data so that he can improve the grazing rates. Laurie R. asked Ken H. to compare the final reservoir assessments to the model at the workshop. Tammy Allen asked Ken H. about the idea that the watershed model will be used to input data into the reservoir data and thought that is might be a problem to use a model to predict reality when it is using modeled data for input data. Joni N. stated that they should first establish the allowable load first, then to what if scenarios and see what is feasible.

2. Water Quality Targets

Steve L. proposed a new topic for the committee and that is to begin establishing numeric water quality targets. After a look in the PIP, Steve noticed that the group needs to develop water quality targets, not just narrative goals. There are several working papers that the technical committee will be responsible for in the near future (Solutions and Benefits, Costs of Solutions, WQ targets, Feasibility Alternatives). With the models close to being fully usable, coming up with water quality targets is close. The committee understood the need but did not want to take action on this topic.

3. Action Items

TMDL development = Joni will provide an outline and a good example of a TMDL

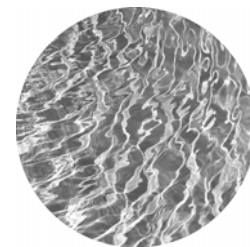
Reservoir assessments = they will be combined with comments and provided on-line. All comments are due by August.

State letter = Laurie R. talked with Lucia and agreed with the schedule. There is still a question about how this concern got started for CDPHE. Steve suggested that a letter is not needed since BMW is right on track with the PIP. The committee agreed to complete the paper trail and do a response letter clearly showing all the tasks that have been completed from the PIP. Laurie R. will write and send the letter that include a clear table of all the tasks that have been completed or being worked on.

Long Range budget = Tech committee needs to be thinking about what projects will there be in the future that BMW will have to fund.

Barr/Milton Watershed Association

Technical Committee



BMW Technical Committee
 Thursday, July 24, 2008
 Metro Wastewater Reclamation District, Administration Building
 10:00am – 12:00pm

Committee Notes

Attendance

Steve Lundt (Metro)

Darcie Garland-Renn (Integral)

Linda Boyle (Aurora)

Chris Piper (Denver Water)

Todd Harris (Metro)

Ken Heim (ENSR)

Matt Malone (DRCOG)

Ken Wagner (ENSR)

1. Water Quality Modeling

Ken H. stated that both models are fully calibrated and ready to be used. The next step is to run the base scenarios that were discussed over the phone with Steve L. for about an hour last week.

To be efficient with money and time, ENSR wants to be clear on what they will do prior to the third workshop. There are 5 base scenarios categories that will be covered. 1. Allowable Load - (Ken W. will cover this with is empirical models), 2. Wastewater – Ken H. will run the model with the three largest WWTF (Metro, L/E, and S. Adams) at three different TP levels, 1ppm, 0.5 ppm, and 0.05ppm). 3. Reservoir Management – Ken H. will run one scenarios where no Metro effluent is pumped to Barr. Instead it will go into the S. Platte River and the difference will be made up by diverting the same volume of water from the S. Platte River in June. 4. Land Use – Ken H. will run two scenarios, one will be zero wastewater and this will show what stormwater impacts there are and the second one will be no return flows from agriculture. 5. Reservoir Treatments – Ken H. will model what happens to internal loading if it is treated and if it plays a major role if all the inflow sources are taken care of.

A couple ideas for other scenarios were talked about but they will be more appropriate for the trained BMW person to run, not for this initial scenarios stage. Ken H. will run these 5-6 scenarios and provide a summary of them prior to the workshop. Ken H. will spend some time on them but the focus will be to have the audience use the outcomes to come up with other more realistic scenarios.

Ken W. then talked about linking the models to pH. Ken W. said that these models are now complicated because of the complexity of the watershed. Simple models will be used to see what the targets are to keep under a pH of 9.0 85% of the time. Need to link chl-a model results to TP and then to pH. For Barr to have pH less than 9.0, then chl-a mean needs to be around 17 ug/L and TP around 200 ug/L. This TMDL approach needs to be taken with steps. So the first target for TP should be about 200 ug/L. Then the next level would be around TP of 40 ug/L. This would be over a 90% reduce from the current state. For Milton to keep a pH under 9.0, chl-a needs to be around 7 ug/L and TP around 200 ug/L also. For a guarantee though, the TP needs to be around 25 ug/L. Ken W. also estimated that the allowable load would be around 5,000 kg/yr.

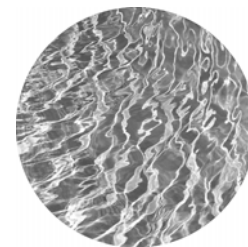
To fix the pH problem, the cheapest and quickest way would be to do something to the reservoir. Biomanipulations are not the quickest or most reliable. Physical mixing would be the best way to possibly get the pH down. Alum and other P-removal methods are not long term approaches.

Both Ken W. and Ken H. will provide a pre-workshop write up and provide it to Darcie who will put together a small set of materials for people to study before the workshop. Ken W. will provide a about 4 graphs and a simplified table of all the numbers.

They will also compare the modeling results to the watershed assessments. The draft workshop agenda also looked okay to both Ken W. and Ken H. Darcie will get out the final agenda and work on the modeling newsletter as soon as possible.

Barr/Milton Watershed Association

Technical Committee



BMW Technical Committee
 Thursday, September 25, 2008
 Metro Wastewater Reclamation District, Administration Building
 10:00am – 12:00pm

Committee Notes

Attendance

Steve Lundt (Metro)	Todd Harris (Metro)
Darcie Garland-Renn (Integral)	Ken Heim (ENSR)
Linda Boyle (Aurora)	Kelly DiNatale (United)
Chris Piper (Denver Water)	Ken Wagner (ENSR)
Tammy Allen (CDPHE)	Joni Nuttle (CDPHE)
John Stednick (CSU)	Laurie Rink (FRICO)

1. Water Quality Modeling

Steve Lundt updated the committee on what was discussed at the BMW board meeting that week. The decision was to do the actual workshop #3 at the October 28th stakeholder meeting. The idea is to develop the next list of scenarios for ENSR to run at the stakeholder meeting. Ken Wagner stated that he wanted people to come up with scenarios based on what they wanted not what the models can handle.

John Stednick asked if the model can be populated with 2008 data because he noticed a prolonged high pH season this summer. After some discussion, it was decided that it would be too difficult with not enough time or room in the scope to do that. But the real meat of the request was to see if the warmer, dryer climate caused the pH to be more of a problem. That can easily be modeled.

John Stednick requested that ENSR develop a priority list of the variables so that BMW can focus on the important ones when monitoring and gathering data. ENSR agreed.

Ken Wagner said that he will be working more on the target values for pH, Chl-a, and allowable loads and will be sending out a more final document to the BMW board. Ken Wagner emphasized that it is not the number that is important but the range of conditions or the probability distribution.

Laurie Rink asked the question if ENSR will partition out the sources into PS, NPS, and internal loading. Ken said yes. Ken said that he prefers to do implicit assumptions when calculating margin of safety. It is a better approach than explicit assumptions that lead to ridiculously low numbers. Joni Nuttle personally agreed with this but said that EPA favors explicit MOS assumptions.

Joni Nuttle stated that the BMW group did not have to worry about rushing to implementation. Ken Wagner strongly stated that you can't compare Barr/Milton to other reservoirs because of the situation. 100 ug/L of TP is crazy for most lakes but makes perfect sense for Barr and

Milton. Todd Harris suggested that barr and Milton are just naturally high in pH due to the chemistry of the bicarbonate system. Ken Wagner did not agree totally because there are other bicarbonate systems with not this problem. It was stated that any assumptions need to be documented clearly for Joni so she can respond. Ken Wagner said that you need to present the best game for the least amount of pain.

Ken Wagner will be clear on what you have to weight to figure out allowable load in the next deliverable for allowable loads.

There were no comments on the modeling report draft outline. All comments are due by Oct. 28th. ENSR will provide a final draft for comments.

The idea of a chl-a threshold of 25 ug/L for barr and Milton seems to makes sense for ENSR's modeling results.

Joni reminded committee that they need to work with the Standards group because it is stated in the PIP. Todd Harris talked about EPA's adaptive management and TMDL approach. Joni also stated that BMW association can do a UAA after the TMDL is written.

Joni and Tammy will look over the PIP and get back to the committee on what products need to be done. Action Item is to have the Standards unit provide input on the PIP deliverables. Joni will also try to get EPA to attend the next stakeholder meeting.

Linda Boyle asked if the TMDL guidelines change much. Don't want to go on a current or old example and then have the guidelines change in the next year. Joni said that the example is outdated but the guidelines are good. Tammy Allen will get stormwater maps to darcie.

Laurie Rink explained that we are looking beyond the datashed now that we are getting into the scenarios and development of a pH TMDL. Laurie is working on a comprehensive list of sources beyond the datashed, especially up clear creek and big dry creek. CDOT MS4 maps can help with making this list.

Darcie is working on a subwatershed map of BMW to show source hot spots.

2. TMDL Preparations

How to begin developing the TMDL was talked about. Steve Lundt reminded the committee about what options have been discussed before. The plan is to still wait and see the final modeling report, see how many pieces BMW can fill in, and then maybe continue with ENSR to complete the third party TMDL.

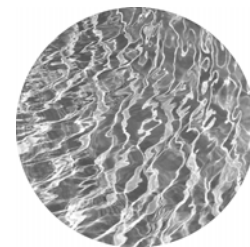
3. New Items

FRICO and Denver Waters water court decision about no pumping of effluent will hopefully be discussed at the stakeholder meeting. FRICO, depending on the judge, may or may not pump this coming winter.

It was decided to have a conference call on Oct 23 to prepare for the stakeholder meeting and then to reschedule the real committee meeting for Oct 30.

Barr/Milton Watershed Association

Technical Committee



BMW Technical Committee
 Thursday, October 23, 2008
 Metro Wastewater Reclamation District, Administration Building
 Conference Call

Committee Notes

Called In

Steve Lundt (Metro)

Darcie Garland-Renn (Integral)

Linda Boyle (Aurora)

Laurie Rink (FRICO)

Todd Harris (Metro)

Ken Heim (ENSR)

Kelly DiNatale (United)

1. Go Over Modeling Options

Steve Lundt started to go over the spreadsheet that bracketed the categories of potential ideas to build scenarios. Kelly DiNatale stated that if a higher treatment level of 1.0 mg/L for TP it would need to be done year round. But if the treatment level is less than 0.5 mg/L for TP, then it would make sense to look at a seasonal scenario.

URBAN

Point source – seasonal does make sense and to include all 9 WWTPs.

Non Point source – P-bans can be modeled by changing coefficients. Ken W. has mentioned that detergent bans don't work but lawn fertilizer bans do. Laurie Rink ask about permit and non permit stormwater and how to model both. Ken H. said that we will need the MS4 overlay so that any changes can be correctly added to the right sub-watersheds. Laurie suggested that on top of the WWTP scenarios, that we predict a % reduction from permitted stormwater and then add a % for non-permitted stormwater.

Idea was given to propose a watershed coordinator meeting to talk about all this.

RURAL

Point Sources – will see what the smaller WWTP can do for treatment and look at changing coefficients for runoff.

We then talked about the sub-basin map that Darcie put together. There are two options to look a the flow data, either accumulatively or individually. Darcie's map looks at individual sub-basin sources.

Laurie Rink asked if we hand enough modeling information to do a P budget for the watershed that would include: background, WWTP, permit storm water, and nonpermit stormwater. The answer was yes.

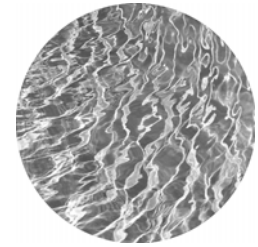
RESERVOIR MANAGEMENT

Laurie Rink said that FRICO is fully accepting of any idea to do in-reservoir treatment.

The committee, with the lead suggestion from Laurie, agreed that the next round of scenarios need to be not too specific but provide general areas of improvement to see what happens.

Barr/Milton Watershed Association

Technical Committee



BMW Technical Committee Thursday, October 30, 2008 Metro Wastewater Reclamation District, Administration Building 10:00am – 12:00pm
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Committee Notes

Attendance

Steve Lundt (Metro)	Todd Harris (Metro)
Darcie Garland-Renn (Integral)	Ken Heim (ENSR)
Linda Boyle (Aurora)	Joni Nuttle (CDPHE)
Michelle Ryerson (Metro)	Laurie Rink (FRICO)
Al Polonsky (City of Denver)	

1. Water Quality Modeling

Summarize the Stakeholder Meeting – Steve Lundt summarized the meeting and nobody had anything else to add. Then Steve Lundt asked the committee to offer any thoughts about it all. Steve L. stated that he was very concerned about two items: 1. moving from 1.0 mg/L to 0.1 mg/L for treatment and 2. going from three largest WWTP to only two. Steve Lundt thought that at the August meeting, 1.0 mg/L was a good goal and that he was promoting it at Metro. Laurie Rink asked about the different treatment methods with the different concentration levels. Biological nutrient removal (BNR) can get to 1.0 mg/L and that is not too expensive relatively but when you go to 0.1 mg/L now it is basically building a drinking water plant on the end of the wastewater treatment plant. Costs are very different as well as the treatment method.

The next topic was talking about the allowable load and the pH TMDL. Steve Lundt stated that the allowable load is at about 11,000 lbs/year according to ENSR and that internal loading in Barr is about 8,000 lbs/yr. Steve asked Joni Nuttle how will the state deal with internal loading. Joni will look into it and get back to the group. Joni Nuttle suggested including the NPDES permit writers with this TMDL development so that they understand the situation. Can't have zero wasteload allocations for the TMDL.

Then the committee spent about an hour to summarize the scenarios that were discussed at the stakeholder meeting.

1. Wastewater Scenario
 - a. Metro and L/E treat at 1.0 mg/L
 - b. Then add Centennial to 1.0 mg/L
 - c. Then have all 9 WWTPs at 1.0 mg/L
 - d. Do the same sequence but at 0.1 mg/L
2. Stormwater
 - a. Have all WWTPs at 0.1 mg/L and then reduce permitted stormwater by 25%
 - b. Then add another 25% reduction of phosphorus from non permitted stormwater
 - c. Then add a 70% reduction from internal loading

All of these scenarios will be run with additional information that reflects reality:

- Reduce total nitrogen by 75% from Metro
- Reduce total nitrogen by X% from L/E (Steve will find this out)
- Reduce total phosphorus by X% from Big Dry Creek watershed due to tertiary plant upgrades for Broomfield and Westminster. (Steve will find this out)

The percent reductions for permitted and non-permitted stormwater will also be investigated. Al Polonsky said he would check with the City of Denver as well as Linda will check with Aurora.

The schedule is to get final board approval of these scenarios, have ENSR modeling them, and then do the fourth and final modeling workshop sometime in January of 2009.

ENSR is also going over our comments for the model report outline.

Steve Lundt will send out a summary of the final scenarios to the BMW board and have then e-mail their vote to Laurie Rink. Steve Lundt will also contact Ken Wagner to remind him that his upcoming allowable load report needs to just get to Laurie Rink first and she will then send it out to the board.

2. PIP Products

Steve Lundt reminded the committee of the various technical products that need to be produced in the near future. Joni Nuttle and Tammy Allen were assigned to look over the PIP products and especially those that related to helping or assisting the state with nutrient development. Joni stated that they had not done the review yet.

Laurie Rink suggested using Ken Wagner's allowable load document to help with the WQ target product. Then it was suggested that the remaining products were all interlinked, Solutions and Benefits would lead into Feasibility Alternatives and Costs of Solutions. It was also suggested by the committee to do some kind of BMP field trip to help get ready for the 2009 NPS grant application process.

3. pH TMDL

There are two technical committees left before 2009 is here when the pH TMDL development starts. Todd Harris, again, suggested doing a phased TMDL approach that EPA supports. Joni Nuttle explained that the phase approach is the implementation part of it, not the actual TMDL. Steve Lundt asked Joni if the BMW association could update or review the pH TMDL at anytime and Joni will find the answer to this question. Steve then asked for volunteers to help write the TMDL. Basically, it would be like the watershed plan where individuals will write specific sections. Nobody volunteered to write a section. Laurie Rink offered that she will write sections 2 and 3 when Ken Wagner sends in his allowable load document.

Next Technical Committee meeting will be December 11th due to the Thanksgiving holiday at the end of November. Agenda items will include preparing for the January modeling workshop, coming up with a list of technical items that will need to be budgeted for, and grant funds for implementation in 2009.