Missouri
Department of
Natural Resources

DRAFT HINKSON CREEK TMDL
PUBLIC COMMENTS

Public Notice
Sept. 18 – Oct. 9, 2009

Hinkson Creek
WBIDs # 1007 and 1008

Boone County, Mo.

Missouri Department of Natural Resources
Water Protection Program
PO Box 176
Jefferson City, MO 65102-0176
800-361-4827 / 573-751-1300

Fwd: Public Works comment to the MDNR 's proposed Hinkson Creek TMDL .

Steve Hunt to: John Hoke 10/09/2009 09:31 AM

John,

The attached letter contains Columbia's comments on the Hinkson TMDL. This was mailed yesterday.

Please advise if you have any questions or would like to discuss.

Steve Hunt, P.E.
Environmental Services Manager
City of Columbia
Public Works Department
(573)874-7250

>>> John Glascock 10/8/2009 11:12 AM >>>

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CITY OF COLUMBIA, MISSOURI
PUBLIC WORKS DEPARTMENT

October 7, 2009

Mr. John Hoke
Water Quality Monitoring and Assessment Section
Water Protection Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102-0176

Re: Hinkson Creek TMDL in Columbia, Boone County

Dear Mr. Hoke:

Thank you for the opportunity to comment on the draft of the Hinkson Creek TMDL. We understand the difficult task assigned to DNR, which was to determine a Total Maximum Daily Load for Hinkson Creek to help restore the stream's designated uses.

In general the City of Columbia is very concerned about the proposed TMDL because the study to support it appears weak while the costs of implementing it will be very large. In the public meeting of September 22, and in comments since then, DNR staff has seemed unaware of what is entailed in reducing the runoff volume from a given area by 68 percent.

We are painfully aware of such things because we have been trying for the last decade to include water quality features, including runoff reduction, in many of our projects. Even modest gains in runoff reduction are costly in design, land acquisition, construction, inspection and maintenance. That is true for small storms like the water quality storm (1.3 inches). For larger storms the volumes are so large that the task is simply not feasible.

We are also concerned because the proposed rule is so far out of proportion to what the study of Hinkson Creek found. According to the study, the creek appears to be very close to the biological activity required for the stream—a score very close to 16, which DNR recognizes as fully supporting. Every location but one was fully supporting at some point during your study. And yet, we are being told to spend tens to hundreds of millions of dollars to correct the situation. We want to improve Hinkson Creek and make it as healthy as possible, but there are other stormwater issues in Columbia that demand attention, not least of which are the restoration and preservation of our other major creeks.

The study fails to take into account things that have already been done to help Hinkson Creek. The area just north of Walnut, which is noted as a hotspot in the TMDL, seemed to improve even before the study was

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completed. Since then, our new stormwater ordinance and rules have required the installation of two large extended detention wetlands between the commercial development to the east and Hinkson Creek. This area now has more stormwater control than it has had since it became a clay mine many years ago.

Obviously, no study is going to provide up-to-the-minute information on Hinkson Creek, but the point is that Columbia will be required to invest large sums of money without taking into account what has been done and what will be accomplished with measures already in place.

Given the weaknesses of the study, the relatively good condition of the creek, the necessity to have resources available to protect other streams and the fact that new rules which will help the creek are in place, the City of Columbia respectfully suggests that more modest goals are called for. Further, the City suggests that more study is called for to better target the actions necessary to restore the stream's uses. Perhaps a better approach would be to focus on what the creek needs, e.g. clean water, rather than on what it doesn't need. This would open the possibility to other practices that do not necessarily reduce volume.

A more detailed list of comments follows:

Flow as a Total Maximum Daily Load

The Vermont TMDL for Potash Creek has been cited as a model for this TMDL. The study for the Potash TMDL was extensive and the results were closely reasoned and well presented. The resulting rule seems well supported and reasonable. The proposed Hinkson TMDL is not nearly as well supported by study and analysis and yet the proposed rule will be enormously costly to implement.

The Potash Brook TMDL established stream flow as a surrogate for sediment, which was identified as the primary pollutant of concern because it had choked out stream biota habitat. The proposed Hinkson TMDL uses stream flow as a surrogate for an unknown pollutant, a relationship which does not seem to be supported by the reasoning Vermont used. Thus, this proposed rule seems to be poorly supported by precedent for using flow as a surrogate as well as poorly supported by the study that has been done. The City of Columbia would be more supportive of the proposed rule if DNR had shown that sediment is the problem and done the work to link desired outcomes for sediment transport to specific flow targets, or if they had done so for some other pollutant or suite of pollutants.

From *Final Potash Brook TMDL-October 2006, "Due to the rigorous application of the attainment stream approach in the Potash Brook TMDL, the targets are believed to be particularly accurate thus reducing the need for an overly conservative or arbitrary margin of safety."*

This does not appear to be the case for the Hinkson TMDL.

Volume Reduction Costs

The reduction of runoff of 68% in rainfall events from ½ inch-5 inches entails an investment of anywhere from tens of millions to hundreds of millions of dollars, depending on the cooperation of private landowners (see discussion of Volume Reduction Costs below). This, in and of itself, may not be sufficient cause for criticizing the TMDL. However, the enormous cost and the risk that the TMDL will not work, together with the limited study in the work done to establish the TMDL makes this proposed rule overly burdensome to the citizens of Columbia.

The best of the green infrastructure practices like those listed in Section 11.1 generally attain, at best, around 60% annual reduction. One of the most affordable practices for volume reduction is bioretention. The cost per treated acre of impervious surface for bioretention is relatively high; from $10,000- $30,000 per acre of treated impervious surface (based on treating 1.3 inches of runoff), not including land acquisition. The maintenance costs, which are generated in perpetuity, can be quite high as well. This cost is unreasonable given the limited amount of study done and the relatively low level of impairment that limited study revealed.

To get an idea of the scope involved:

To treat the 1" precip event;
Urban Target Runoff = 10,550,000cf (Table 13 in proposed TMDL)
Bioretention at $6.8/cf
Cost $71.7 million (not including land costs, not assuming retrofit)

To treat 5" precip event;
Urban Target Runoff = 114,850.000cf
Bioretention at $6.8/cf
Cost $781 million (not including land costs, not assuming retrofit)

Notes:
This cost per cubic foot is from a stormwatercenter.net fact sheet and is on the upper end of the range of costs noted in the discussion above. The cost does not include land acquisition or the extra difficulty of retrofitting.

Bioretention is not expected to remove 68% volume (50-60% is more reasonable)
Bioretention and most other LID practices have not been designed for such large volumes.

Section 2.1

Impaired section described here does not match that shown in the drawing on page 2.

Section 2.3

Most soils in the watershed provide less than the recommended ½" per hour for infiltration which is the minimum generally recommended for infiltration type practices. This will limit the effectiveness of vegetated infiltration practices like rain gardens.

Section 2.4

In-stream erosion and deposition is probably the largest source of sediment problems and should be mentioned in the list here. This would better support the thesis that flow itself, by causing in-stream erosion, is a major problem.

Section 2.5.1

The sample size of the biological assessments is small. Some of the poor scores were explained by things that were immediately addressed such as salt laden runoff from a road maintenance facility and poorly stored insecticides. The limited number of assessments done reveal a stream that is hovering near attainment so that the costs of the proposed rule are enormous compared to the problem being addressed.

Section 2.5.2

Most of the runoff from the area noted now runs through water quality BMPs.

Section 2.5.4

Last sentence of last paragraph: Reducing volume per-se will not necessarily perform the function of increasing natural flows enough to accomplish the stated goal. Evapotranspiration is a major portion of any volume reduction in a volume reduction practice.

Section 5

First paragraph: Volume is not the only concern, timing is important, too. We can envision a situation in which we do an excellent job of volume control and leave the stream life starved for water.

Section 5.1

There is a very short period of streamflow data from recent years (2007-2009) with which to establish a relationship with past flows.

The R-squared for Equation 1 should be much closer to 1.

Section 5.2

It has not been established that increased volume "causes" contaminant loading. It is said elsewhere in this draft to be a surrogate.

Section 5.2.1

Last sentence: This is an enormous assumption. Hinkson Creek has had many stressors over the years. Mid 1800s to mid 1900s agricultural practices and coal mining likely pushed the creek to a point that what we're seeing now is an improvement. It also may have pushed it to a point, in terms of geomorphology, which is very difficult to recover from. Many sections were incised deeply enough before the 1990s so that the stream was no longer connected to the floodplain for intermediate flooding events.

Table 10

The ½" and 1" runoff values are counterintuitive. Is there a good reason?

Section 5.2.2

Last Sentence, the reduction in volume does not "ensure" water quality standards.

Section 6

Are active construction sites (which are permitted, pg 27, 3rd graph) required to reduce volume of runoff?

Section 11

First Graph, retention will not reduce volume, evapo(transpi)ration and infiltration are the primary ways that volume can be reduced.

Of these, only infiltration will improve base flow to what it was before development. Baseflow before development was fed by water infiltrating over 100% of the area. Stormwater treatment will involve some fraction of this area and therefore not as much infiltration can occur.

To maintain stream flow, it may be better to use extended detention of some sort with a prolonged release rate in addition to some, more modest volume reduction. This could work in combination with whatever infiltration can be accomplished to maintain baseflow to acceptable levels.

Bullet 3, baseflow will not increase to predevelopment levels for the reason stated above.

Paragraph 3, capturing 1.3" in our area can account for 90% of rainfall.

Paragraph 3, LID practices (and green infrastructure practices) generally focus on the water quality storm rather than large events. For instance bioretention can remove up to 50% of the annual volume from the upstream drainage area because it is sized to treat the water quality volume, but to size it to remove 68% of the 5" storm is impractical. A better strategy would be to remove 50% of water quality storm and capture and slowly release 1-year storm.

Appendix C

The rainfall data in Appendix C does not match the data available from NOAA. The source of the data should be noted.

In conclusion, we appreciate the opportunity to express our concerns and we encourage your department to conduct further study and develop a more realistic and achievable TMDL.

Respectfully,

John Glascock

John Glascock, P.E.
Director

JDG/TEW:mp

c: Steve Hunt, P.E., Manager of Environmental Services
Tom Wellman, Stormwater Engineer

Comments on Draft TMDL for Hinkson Creek

John Holmes to: john.hoke 09/30/2009 03:41 PM
Cc: COMO-SW-Eng, KMiller, KPearson, SElkin, SSHUNT, "Stephen Lin"

Follow Up: Normal Priority.

Mr. Hoke,

Attached are my brief comments on the Hinkson Creek TMDL. I will plan to send a hard copy as well.

Thanks.

John Holmes, P.E.
Allstate Consultants, LLC
3312 LeMone Industrial Blvd.
Columbia, MO 65201
573-875-8799

Hinkson Creek TMDL Comments Holmes.pdf

allstate consultants llc
Engineering • Planning • Surveying • Investigative • Geotechnical

September 30, 2009

Mr. John Hoke
Water Quality Monitoring and Assessment Section
Water Protection Program
Missouri Department of Natural Resources
PO Box 176
Jefferson City, MO
65102-0176

Re: Comments on the Draft Hinkson Creek TMDL

Dear Mr. Hoke,

I am a Columbia resident and a civil engineer specializing in storm water issues. I work for Allstate Consultants in Columbia. The following bullet list summarizes my concerns with the proposed TMDL for Hinkson Creek. Explanation of my concerns is in the text following the bullet list.

- The equations used to set the target volumes are clearly in error.
- Even if the equations were corrected the requirements would still be unreasonably burdensome.
- The magnitude of the volume requirement described in sections 5-7 is inconsistent with DNR's suggested implementation approaches described in section 11. Disconnecting downspouts, encouraging rain barrels, adding a few rain gardens and treating hot spots won't come close to meeting these requirements.
- The TMDL requires a large reduction in the amount of water that runs off from all existing areas (except forested areas) including residential areas, green spaces and agricultural fields.
- The TMDL would require that no additional runoff be created by any new development. This far exceeds the requirements of all recent storm water ordinances.
- The TMDL would expose the City of Columbia, Boone County and the University to potential lawsuits if anyone thinks they are not doing enough to meet the requirements.
- The tie between the SCI scores and the suggested requirements has not been established.
- New data that will soon be available may help pinpoint the real problem. It would make sense to wait for this data before implementing such an expensive possible solution.
- The specific requirements of the TMDL are unclear.
- The money required to implement this could do more good for streams in currently undeveloped areas.
- Although the TMDL language clearly requires volume reduction instead of detention, DNR staff at the public meeting on September 22, 2009 encouraged the use of detention to meet these goals. Even if detention were an allowed approach it would not be reasonable to attempt to detain water to the magnitude described in the TMDL.

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- The TMDL approach needs to be re-evaluated and the requirements clarified. Given the need for significant changes and the uncertainty as to the intent and specifics of the original TMDL the community needs to get the opportunity to re-evaluate the revised TMDL before it becomes official.

Details

The equations that are being used to set the volume reduction level are clearly incorrect. Equation five, which sets the target volume of allowable runoff for a given rainfall depth predicts less runoff from a 2" storm than from a 0.5" storm. Equation six predicts less runoff from a 1" storm than from a 0.5" storm. These results are clearly wrong. It is inappropriate to create targets using equations that make predictions that are physically impossible.

The TMDL then goes onto say that for a 2" rainfall, a 68% reduction in predicted runoff is required to bring the runoff in line with what the erroneous equation five predicts would have been the average runoff for a 2" rainfall during the period from 1975 to 1991. Based on this, the results are extrapolated to say that we must therefore reduce the volume of runoff by 68% **"under all precipitation event-runoff volume scenarios".**

Because the percent reduction is based in part on equation 6 which is based on current conditions as measured by the Providence Road stream gage it is clear that the TMDL is written to reduce flow 68% **below current conditions**. So, even if there is no additional development, we will still be required to retrofit treatment to existing agricultural, open space and developed areas (including residential) to reduce the runoff from them by 68%. There are no reasonable rules for new development that will accomplish this. Requiring all new development to create zero increase in the volume of runoff (which would be impossible to accomplish in a reasonable manner) would still leave us with the requirement to reduce the total volume by 68%. In fact, at the bottom of page 27 the TMDL specifically requires no increased runoff volumes from new development. It says this applies to areas within agricultural and open areas, but doesn't say it applies to forested areas.

Assuming that **"under all precipitation event-runoff volume scenarios"** was intended to mean all the precipitation events listed in table 10, then the result is that we need to store, infiltrate or evaporate 68% of the 5" predicted runoff or 391,065,978 ft^3 (8,978 ac-ft). In other words, a 10' deep 898 acre lake needs to be made to infiltrate or evapotranspirate between rainfall events to take care of the area upstream of the Providence Road gage. At 6.7 ft^3 per standard 50 gallon rain barrel, this equates to 58,368,056 rain barrels.

Another way to visualize the requirement is on a per acre basis. If you divide the required storage under the 5" rainfall scenario by the total acreage contributing flow at the Providence gage, the requirement becomes a storage volume of 8,708 ft^3 per acre. This equates to 1,300 rain barrels per acre over the entire Hinkson basin, not just in Columbia. However, the storage requirement is not divided equally over all areas as will be discussed below.

A common design for a rain garden is about 1' of depth with about 2' of loose soil beneath that can store some water in the pore space. If the soil is well fluffed, it can store about 40% of its volume in water. So, a typical rain garden with loose soil can store a depth of water of about 1.8'. Dividing the required per acre storage by 1.8' gives a required rain garden area of 0.11 acres per watershed acre. In other words, if we convert 11% of the Hinkson basin to rain gardens, we will have room to store 68% of the 5" storm. For these rain garden calculations I had to assume no infiltration except for in the pore space of the planting bed because the TMDL says nothing about how much time we have to handle the volume and the clay soils around here infiltrate very slowly. For high intensity events, the infiltration volume during the storm is generally minimal and rain gardens will have to be designed to store the entire volume until it has time to infiltrate and evaporate. If we assumed a slow steady rain and that some of the rain gardens would have favorable conditions for deep infiltration we might be able to reduce this storage requirement some. However, not all rainfall events are slow and steady.

If "under all precipitation event-runoff volume scenarios" were to be interpreted to include the 100 year 24 hour storm we would need to extend table 10 to 7.3" and the lake would need to be 10' deep and 2,583 acres and we would need 167,927,340 rain barrels. It is not a stretch to think that someone in the future may interpret "under all precipitation event-runoff volume scenarios" to include the 100 year 24 hour storm. This interpretation could be adopted by the EPA, future regulators at DNR or by groups of people who opt to sue the City or County if they feel they are not doing enough.

If it was the 5" storm that was intended as the largest event to which the 68% would apply, the storage volume (391,065,978 ft^3) is larger than the entire volume of runoff predicted by equation 6 for the 4" storm. So, the 4" storm and all smaller events would be completely absorbed by the retention volume and none of it would make it to the streams. There is no physical way to separate 68% of the rainfall from a variety of different storms. You have to pick a volume that you are going to provide capacity for and create it and route the water to it. So, if this TMDL were fully enacted based on a 68% reduction for the 5" storm, the streams would not even show any sign that it was raining until we had more than 4" of rainfall. This is not natural. The frequency with which the overbanks would be inundated would be reduced significantly and they would not function naturally.

In the public meeting on September 22, it became apparent that the intent may have been to only require the storage of 68% of the 2" storm, although that is not clear at this point. In this case, the size of lake required to store the water would by 10' deep and 160 acres. The storage volume would be 69,508,298 ft^3 or 1596 acre feet. We would need 10,374,373 rain barrels or 231 rain barrels per acre. According to the volumes in table 10, this storage would absorb the entire 1" storm, but let a little bit of flow into the creeks in the 0.5" event. During the 3" storm, the volume of flow in excess of the storage volume would be 187% of the target volume. The 3" 24 hour storm occurs on average once per year in Columbia.

The TMDL then goes on to assign responsibility for the reduction based on whether or not an area is currently developed or not. This makes sense because the storage areas need to be where the excess water is. However, it also means that developed, agricultural and open space areas will have different per acre requirements than the basin wide averages discussed above. Applying the weighted influence described in table 12 to the predicted runoff from table 10 and then subtracting the target runoff values from table 13 gives an estimate of the volume of reduction needed for both the developed and undeveloped areas to reconcile the results of equations 5 and 6. Dividing these reduction values by the total area of each type of property

results in the volume of reduction required per acre for each rainfall amount. For the 5" rainfall, the TMDL would require about 13,558 ft^3/acre of reduction per developed acre and 6,092 ft^3/acre of reduction per undeveloped acre. In other terms, we would need to store the water from 2,033 standard rain barrels per acre of developed area and 913 standard rain barrels per acre of agricultural and green space until we can infiltrate or evaporate it. It is important to note here that existing residential areas are considered developed. My quarter acre home would need 508 rain barrels because my downspouts are already disconnected and I couldn't reduce flow by disconnecting them again. Alternatively, if we consider 1' deep rain gardens with 2' of permeable soil as described above, we would need 0.17 acres of rain garden per acre of developed area and 0.08 acres of rain garden per acre of agricultural and green space. This assumes that each property is graded in a manner that will facilitate getting the water to a rain garden or rain barrel. A series of berms, swales and pipes will be needed to get the water from existing development into the rain gardens.

If the TMDL were to be revised to only require the 68% reduction to the 2" storm, the requirement would then be a 2,807 ft^3 reduction per acre of developed area (including residential) and 1,261 ft^3 reduction per acre of agricultural and open space. This would equate to 421 rain barrels per developed acre and 189 rain barrels per acre of undeveloped area (not counting forest). Alternatively, it would be equivalent to converting 3.6% of developed areas and 1.6% of all other areas except forests to rain gardens. Of course, we should also consider that not all properties are going to have the terrain needed to build a rain garden and get the flow to it, so the other properties would have to pick up the slack.

Even if the requirement were taken all the way down to 68% of the 0.5" rainfall, 192 rain barrels would be required per acre of developed area and 86 rain barrels would be required per acre of agricultural and open space. We would need to convert 1.6% of developed and 0.7% of undeveloped areas to rain gardens to accomplish this.

One point I should also make here is that this TMDL does not allow us to address its requirements through the use of detention basins. The requirement is that we reduce the total volume of water that enters the stream, not that we manage the peaks. While very large detention basins that let the water drain out over a period of a few days might help to recreate something similar to the natural hydrology, they are not given any credit by this TMDL other than for the reduction of water that would occur during the detention period through infiltration and evaporation. Clearly, you would not want to attempt to store 68% of the runoff from a 5" storm over a large area in a detention basin until it evaporated and infiltrated.

In the September 22 meeting it became clear that DNR staff was not certain that they intended to prevent the use of detention basins. Assuming the TMDL were to be modified to allow the use of detention the volume reduction philosophy would no longer make sense because all the water would still get into the stream (except the water that evaporated and infiltrated while in storage). However, they might be able to make it work by including an assumption that storing the volume for some certain period of time was equivalent to infiltrating it. Of course, this wouldn't change the fact that we would need to find space to store these huge volumes of water. We wouldn't be able to grow trees in these areas. We might be able to reduce the volumes slightly because a small amount of water would be released as additional rainfall enters the storage. However, to produce results consistent with the TMDL, the release would need to be very slow and the required volumes would not be much less than required by the current version of the TMDL.

In closing, it is clear to me that the magnitude of these requirements was not properly visualized by DNR. The TMDL and the DNR's power point presentation about the TMDL seem to imply

that we could accomplish the requirement by disconnecting downspouts and encouraging rain barrel use. Review of the residential areas around Columbia will show that the majority of downspouts are already disconnected. Commercial areas probably tend to be significantly less disconnected so work could also be done to "disconnect downspouts" in commercial areas. However, doing so would be expensive and isn't going to begin to achieve the required magnitude of results. As the numbers above show, encouraging the use of rain barrels isn't going to make a measurable dent in this requirement either.

I apologize to the good people at DNR for being so critical but, I am concerned that a few months from now we will hear that the final TMDL only provides half of the volume reduction that was originally suggested by this draft so it is clearly a compromise solution. However, half of a poorly substantiated number is quite possibly still a poorly substantiated number. If anything similar to this draft becomes official, the City of Columbia, Boone County and the University will be faced with the tough choice between requiring the extremely expensive retrofits needed to accomplish the TMDL as written or face lawsuits from people who won't be satisfied unless the Hinkson is taken back to its state before man arrived. It won't matter that DNR's intent was not to get the Hinkson back to a pristine state. It won't matter that it is not really been proven possible to return a stream to its "natural" state. What will matter is that the TMDL says this reduction is required and they will have the leverage they need to make all of us pay to move us towards their dream. In my opinion, we need to wipe this draft TMDL from our collective memories and DNR needs to completely re-evaluate their approach. Given the significance of the needed changes, we should get another chance to review the revised TMDL before it becomes official.

Don't get me wrong. I feel strongly that a healthy level of biodiversity is critical for continued human health and happiness and that it is in our own self-interest to protect the environment. I just disagree with the idea that we need to recreate pristine conditions in every foot of stream regardless of the costs when the money could be much more effectively spent protecting other streams that are already closer to pristine but in danger from future development. Imagine how much stream we could protect in the areas surrounding Columbia if we could tap into $1/10^{th}$ the money that would be spent to achieve this TMDL. I know that section 11.1 states that "green infrastructure typically costs less to install and maintain" but, that statement is meant to apply to new development. In fact, we haven't found it to be true for new residential developments when considered in terms of per lot costs. We've seen that the overall construction costs can go down with green infrastructure, but the space available for buildable lots also goes down, and as a result the cost per residential lot goes up. Some say this is increased property value not increased cost, but not everyone can afford this increased property value. Furthermore, this TMDL has its largest impacts on existing developments and there is no reason to believe that it won't cost a lot of money to retrofit existing areas to capture this runoff. Applying this requirement basin wide will result in additional costs to all of us, both in terms of direct costs to bring our own homes into compliance and in terms of increased costs that are passed on to us by businesses. Money we spend on this cannot also be spent dealing with any of the other challenges facing us.

Even though I think we can live with a non-pristine Hinkson, I am not suggesting that we shouldn't attempt to improve conditions for the Hinkson. The University, with the assistance of DNR, has just established five state of the art sampling stations on the Hinkson and in a couple years we will understand it much better than we do now. If we take a little more time and find out what is really causing the problem we may find that we can solve it with significantly less cost. Review of table 2 shows that the SCI scores are not declining so the risk of waiting is not that great. Further, because of the new Columbia and Boone County stream buffer and storm water ordinances we are already taking steps that could go a long ways towards reversing or at

least stabilizing the problem. There is even a chance that if we just allow the stream to stabilize in its current condition, manage future development, and aggressively target point source pollution violations we will see the Hinkson heal itself to an acceptable level over the next few years. If not, we can try again when we know more.

Sincerely,

John Holmes, P.E.

P.S. Some additional comments are also attached below.

Some additional comments and questions:

What does the term "return transposition" mean? Page 24

Where were the precipitation values used in table 9 measured?

How were variations in the rainfall distribution over the basin accounted for in equations 5 and 6?

I can't get equation 4 as written to give reasonable numbers. Is there a typo?

Equations 5 and 6 as written are clearly only valid at the Providence road gage station. Will the Providence road gage station data in the future be used to determine whether we have met the TMDL requirements? If so, does this mean that we are not intended to apply the TMDL requirements downstream of this gage? I think this point needs clarification.

Why does figure 3 show only the flow duration curves for two years? There are numerous years of data available. It is not appropriate to just present two years of data without discussing or showing how other years compare.

Table 13 is labeled as projected runoff reductions for the WLA and LA, but seems to actually list allowable runoff volumes instead of reductions in volumes. The only reduction on the table is the combined reduction for both. It also seems to imply that a 58.4% reduction is required for the 5" storm? Is this the case?

Hinkson Creek TMDL meeting additional comments

John Holmes to: leanne.tippett.mosby@dnr.mo.gov, scott.totten@dnr.mo.gov, rob.morrison@dnr.mo.gov, john.hoke@dnr.mo.gov

10/21/2009 01:03 PM

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From: "John Holmes" <JHolmes@allstateconsultants.net>

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Hello,

Thanks for the Hinkson Creek TMDL meeting yesterday. I think it was productive.

I have a couple comments, but given that you were not yet in a position to discuss specifics of the next draft I didn't see the point in wasting everybody's time with them. For the most part, my concerns were well voiced by the others in the room that are more directly involved. However, I do want to go ahead and mention a couple things.

1) The first draft TMDL seemed to require that we allow no additional runoff from new development. I would like to suggest that a much more reasonable implementation strategy for new development be that the City and County enforce the new stream buffer and storm water ordinances and storm water manuals that they have worked so hard to develop over the last few years. They haven't had a chance to work yet and while they don't go so far as to prevent any additional runoff they are a major improvement over past practices and they do represent our community's best efforts to find a reasonable approach. They should be given a chance to work and I see no reason why the implementation strategy for new development can't just be limited to continuing on the current path. However, the TMDL language should also give them the flexibility to modify and even reduce the requirements within reason as they learn more.

2) As you noted in the first draft, the implementation strategy also needs to address existing development. I agree that community involvement, voluntary programs, detaching downspouts, rain barrels, rain gardens, etc are an appropriate approach for residential areas. I suggest that you start by calculating the maximum volume of reduction that we could possibly achieve with such programs in these areas using reasonable assumptions about participation. If you must include WLAs for these areas you should back-calculate a reasonably sized reduction volume to use as the WLA based on what is possible with voluntary programs.

3) The question then becomes, how do we deal with existing non-residential development. I don't know, but the solution should consider the enormous costs associated with retrofitting existing development to capture more water. It should also consider the fact that adding to the cost of staying in a current location will increase the likelihood that a business will move to a new location and create new impervious area in another watershed. The

City and County currently have new rules in place that will begin to address existing non -residential development as improvements are made to the developed areas. The implementation needs to consider that this requirement is already in place and may be the most reasonable approach to addressing existing areas. However, If something is written into the TMDL to further address such areas (and I'm not suggesting it should be) it needs to provide the maximum amount of flexibility. For example, it needs to allow options for compensating offsite so that developments are not forced to remove existing improvements. It should also allow the option to treat an equivalent volume of water other than the rainfall that actually falls on the specific site being addressed. We should consider options for limiting the amount of money that must be spent to upgrade any specific difficult locations in recognition of the fact that the money could provide more benefit elsewhere. It should also consider the option to mitigate (if mitigation is required) for existing development through the use of publicly funded regional treatment facilities instead of through new requirements on developments that met the rules that were in place when they were built. It should not force us or even encourage us to replace areas that are currently well vegetated with detention areas. In other words, it should provide more credit for preserving good trees than for killing them to store water.

4) If the next draft is anything like the first, then there are going to have to be implementation measures for agricultural areas. Even if we captured all the runoff from the developed areas, it wouldn't have been enough to make up for the storage volume requirement in the agricultural areas.

5) There was some discussion of using a "reference" stream to establish what level of development can be tolerated while still attaining. Rob mentioned a single "reference" stream, but it doesn't seem possible to obtain any meaningful limits from a single watershed. If the attaining reference watershed is very similar to the Hinkson it will demonstrate that no drastic measures should be required and that maybe the problem has something to do with the stream. If the reference watershed is just a little less developed than the Hinkson, then we won't know if the difference is from the stream or from some particular aspect of the development. If the reference watershed is half as developed as the Hinkson, you will not have proven that it represents the limit of acceptable development by just looking at a single watershed. A more defensible approach would be to look at a lot of streams and develop a general relationship between some measure of watershed development and SCI scores for similarly sized basins. Of course, you would then need to find some way to reduce that measure of watershed development without actually reducing the level of development in the watershed. John used a phrase something like "runoff volume for a recurrence interval for attaining "reference" streams" which I interpret as being this measure of development. I would need more detail before I could comment on this measure. Would it be provided in the form of either an allowable flow rate per acre or runoff volume per acre for a given design storm duration and return period?

6) Someone made the statement that the problem has been determined to be due to urban development. How can you justify this statement when some of the low scores were measured upstream of the urban areas? Any new data that is gathered needs to include more sampling upstream of the landfill as a control to verify that the problem begins in the City. The problem could come from upstream.

7) I think John said something that led me to believe that equations five and six won't be used for the next draft. Hopefully I understood him correctly, because they clearly do not represent reality and should not be used to establish the TMDL.

Thanks.

Allstate Consultants, LLC

John Holmes, P.E.
3312 LeMone Industrial Blvd.
Columbia, MO 65201
573-875-8799

Placed zipped files on FTP site 10/7/09

LATHROP & GAGE LLP

AIMEE D. G. DAVENPORT
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314 EAST HIGH STREET
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PHONE: (573) 893-4336
FAX: (573) 893-5398

October 5, 2009 6 Oct 09

Linda –
Does your group have any of this information?
Ellen

VIA FACSIMILE 526-1146
Ms. Dana Foster, Records Custodian
Water Pollution Control Program
Missouri Department of Natural Resources
Lewis & Clark Building
Jefferson City Missouri 65101

Re: Request for Open Records

Dear Ms. Foster:

This is a request pursuant to the Missouri Sunshine Law, Chapter 610, Revised Statutes of Missouri (RSMo), for access to public records and documents maintained by the Missouri Department of Natural Resources.

Please make available for review all documents, including correspondence, reports, data, charts, graphs, memoranda, telephone records, and any other records pertaining to the draft Hinkson Creek Total Maximum Daily Load (TMDL), including the development of the draft Hinkson Creek TMDL. Documents requested herein include all electronic documents and office files of all personnel involved in the development of the Hinkson Creek TMDL.

Pursuant to § 610.023.3, RSMo 2000, please act on this request within three (3) business days or less of your receipt of this request. Please be advised that the statutory requirement to respond within three (3) days of receipt of this request will not be waived. If this request is denied, please provide us with a written statement of the grounds for such denial, including citation to the specific provision of law under which access is denied, within three (3) business days of your receipt of this request.

Please contact me within 3 days of this request to arrange a time to view the files. We are willing to pay reasonable research time and copy fees, as allowed by § 610.026 RSMo.

Thank you for your assistance. Should you have any questions regarding this request, please contact me at (573) 761-5002.

from Charlene Shoemaker, LAA to Aimee Davenport

To File
Hinkson Creek TMDL

LATHROP & GAGE LLP

DAVID A. SHORR
DIRECT LINE: (573) 761-5005
EMAIL: DSHORR@LATHROPGAGE.COM
WWW.LATHROPGAGE.COM

314 EAST HIGH STREET
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PHONE: (573) 893-4336
FAX: (573) 893-5398

October 6, 2009

Leanne Tippett Mosby
Director of Water Protection
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Re: Hinkson Creek Total Maximum Daily Load (TMDL)

Dear Ms. Mosby:

This letter serves as our request for a 30 day extension of time to comment on the draft Hinkson Creek Total Maximum Daily Load. We have requested access to review the Department's records to provide detailed comments. It is not clear if the Department will grant access to such records in enough time for us to review the records and compile our comments. Please grant this extension to allow enough time to assimilate all necessary information. Thank you.

Yours truly,

LATHROP & GAGE LLP

By: David A. Shorr

DAS/crs

cc: Rob Morrison

10/8/09 I contacted David & let him know we were pulling the TMDL from PN for a redraft. He left a message for me on 10/9 confirming that he rec'd message.

LATHROP & GAGE LLP

DAVID A. SHORR
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December 8, 2009

VIA E-MAIL AND U.S. MAIL

Mr. Scott Totten, Acting Director
Water Protection Program
Missouri Department of Natural Resources
PO Box 179
Jefferson City, MO 65102

Re: Hinkson Creek TMDL

Dear Mr. Totten:

The undersigned represents the City of Columbia, the County of Boone, the University of Missouri, and the Boone County Regional Sewer District.

Thank you for your efforts and willingness to reconsider issues relating to the Hinkson Creek Total Maximum Daily Load (TMDL). We appreciate the Department's efforts to meet with various interested parties to discuss our concerns relating to the strategy and direction originally presented by the Department and our objections and concerns relating to the strategy.

We provide the following comments and concerns and examples of activities that have occurred since the posting of Hinkson Creek to the 303(d) list. This correspondence supplements materials provided on December 1, 2009. It also provides additional information from the Boone County Regional Sewer District and information from quasi-public agencies (such as Transportation Development Districts). We believe these support our position that (a) data collection is inadequate and dated, (b) Hinkson Creek may meet the required water quality standards, and (c) the broad-based approach employed by the proposed TMDL is unnecessary. For reasons stated herein, we request that the TMDL for the Hinkson Creek be reopened and that the current approach be reconsidered.

The sampling data relating to Hinkson Creek is dated and does not reflect current activities.

The last data collection on Hinkson Creek was conducted in the Spring of 2006. Since that time, numerous activities have taken place within the watershed as a result of concerns expressed by the 303(d) listing. These actions, including significant regulatory changes locally, are specifically delineated later in this letter. It is our position that prior to imposing a broad-based strategy to address "unknown" pollutants that have not been properly quantified, the Department is obligated to re-test to determine the current status and take all steps necessary to delineate the "unknown" designation.

Since the original designation of Hinkson Creek to the 303(d) list, numerous activities have taken place in an effort to reduce potential impacts on Hinkson Creek.

Since the original listing of the Hinkson Creek on the 303(d) list, numerous activities have taken place within the watershed that address numerous impacts. Each of the public entities in the watershed have taken steps to enhance the water quality in the watershed. These include improvements by quasi-public entities. A summary of each area's activities is below.

1. Improvements reducing or eliminating impacts to the Hinkson Creek watershed by the Boone County Regional Sewer District appear in Exhibit A.

2. Improvements reducing or eliminating impacts to the Hinkson Creek watershed by the City of Columbia appear in Exhibit B.

3. Improvements reducing or eliminating impacts to the Hinkson Creek watershed by the University of Missouri appear in Exhibit C.

4. Improvements reducing or eliminating impacts to the Hinkson Creek watershed by Boone County appear in Exhibit D

5. Activities by private or quasi-public agencies appear in Exhibit E.

The activities presented in the exhibits clearly demonstrate **SIGNIFICANT** actions on the part of the public to enhance Hinkson Creek and to reduce impacts. Despite these improvements, no additional studies have been conducted. Additional sampling and evaluation is justified to determine if a problem still exists.

Because the TMDL is based on data that may not reflect the current condition of Hinkson Creek, because activities to improve the creek have been implemented (see Exhibits A through E), and because the pollutants are still unknown, we formally request the reopening of this TMDL and the abandonment of the current strategy proposed.

We request a comprehensive sampling analysis, a pollutant specific TMDL which presents a triage approach to address the "unknown" pollutants, and a reasonable methodology which incorporates the activities currently being conducted by this community and our efforts to protect Hinkson Creek.

Your attention to this matter and support of the process currently moving forward is most appreciated. Please contact me at (573) 761-5005 with any questions.

Very truly yours,

LATHROP & GAGE LLP

By: David A. Shorr

DAS/jf
Attachments
cc: Karen M. Miller

EXHIBIT A

BOONE COUNTY REGIONAL SEWER DISTRICT
ACTIONS TO ENHANCE HINKSON CREEK WATERSHED
POST 303(D) LISTING

1. Closed the Fairway Meadows West Lagoon by installing a pump station and pumping flows to the City of Columbia. The Fairway Meadows West Lagoon discharged into a tributary of the north fork of the Grindstone, which is a tributary to Hinkson Creek.

2. Closed the Fairway Meadows East Lagoon by in installing a pump station and pumping flows to the City of Columbia. The Fairway Meadows East Lagoon discharged into the north fork of the Grindstone, which is a tributary to Hinkson Creek.

3. Closed the Lake of the Woods Wastewater Treatment Plant by installing a gravity sewer that connected to the City of Columbia's wastewater collection system. The Lake of the Woods Wastewater Treatment Plant discharged into the north fork of the Grindstone, which is a tributary to Hinkson Creek.

4. Closed the El Chaparral Lagoon by installing a gravity sewer that connected to the City of Columbia's wastewater collection system. The El Chaparral Lagoon was the largest remaining wastewater treatment plant in the Hinkson Creek watershed controlled by the public. It discharged into the south fork of the Grindstone, which is a tributary to Hinkson Creek.

5. Closed the Sunrise Estates Wastewater Treatment Plant by installing a gravity sewer that connected to the City of Columbia's wastewater collection system. The Sunrise Estates Wastewater Treatment Plant discharged into the south fork of the Grindstone, which is a tributary to Hinkson Creek.

6. Closed the OTSCON Wastewater Treatment Plant by installing a gravity sewer that connected to the City of Columbia's wastewater collection system. The OTSCON Wastewater Treatment Plant discharged into the south fork of the Grindstone, which is a tributary to Hinkson Creek.

7. Boone County voters approved a $21 million revenue bond issue in April, 2008, to further improvements to Hinkson Creek. These will close additional discharges to the Hinkson Creek watershed and/or improve wastewater treatment at existing Boone County Regional Sewer District facilities. These include the closure of the Sun Valley Lagoon, the Hillview Acres Lagoon, the Lake Capri Lagoon, the Fall Creek Recirculating Sand Filter, and the Sheraton Hills Wastewater Treatment Plant in 2011. All these facilities are in the Hinkson Creek watershed and are located along State Highway HH. The closure of these facilities will be accomplished by the construction of about five pump stations and forced mains along Highway HH with connection to the City of Columbia's wastewater collection system.

8. In 2010, the budget calls for closure of the Shaw Wastewater Treatment Plant by installing a gravity sewer that connects to the City of Columbia's wastewater collection system. This is a joint project with the City of Columbia. The Shaw Wastewater Treatment Plant discharges into the north fork of the Grindstone, which is a tributary to Hinkson Creek.

These improvements will result in the removal of over 700,000 gallons per day design capacity from discharging into the Hinkson Creek watershed, removing various pollutant loads and bacteria from the watershed, reducing impact.

The District has also increased its sewer system maintenance activities to reduce risk to sewer integrity, which might result in discharges to the environment during peak events and enhancing the integrity of the system.

EXHIBIT B

CITY OF COLUMBIA
ACTIONS TO ENHANCE HINKSON CREEK WATERSHED
POST 303(D) LISTING

1. A significant sewer line has been repaired, which had a direct impact on Hinkson Creek.

2. New storm water, illicit discharge, and stream buffer ordinances were passed from late 2004 to early 2007. A new Storm Water and Water Quality Manual was released in early 2007 and was revised in early 2009.

3. New ordinances require scoring for water quality treatment, which are established up front for development or redevelopment projects. The developer is required to add water quality treatments to the plan until the required score is achieved for the site. These include storm water best management practices that address volume reduction and hydrology modification.

4. All projects, both redevelopment and new development, are impacted by the new ordinance. These include modifications to impervious surfaces, BMP's, volume reductions, and hydrological modifications. Improvements such as rain gardens and bio-retention cells are included in the alternatives to provide scoring.

5. New rules encourage the use of edge buffer outfalls, which work together with the stream buffer ordinance. Water is dispersed through the buffer before reaching the stream so that more water is absorbed and stored in the buffer soil.

6. The point system provided in the rules encourages the preservation of existing soil strata and vegetation through point reductions.

7. The new rules allow for the use of channel protection detention rather than traditional detention in order to modify the hydrograph. The new rules and ordinances have resulted in significant extended detention wetlands being installed behind businesses on Conley Road (just west of Highway 63 and south of I-70) that were identified as hot spots in the original 303(d). These basins treat a significant amount of impervious area and can be expected to have significant beneficial effects on the Hinkson Creek watershed.

8. A number of other private businesses have been required to retrofit storm water treatment practices in the Hinkson Creek watershed as a result of the manual. Some examples include:

   A. Rain gardens and a wetland have been added and the stream buffer enhanced at Stevens Lake Park along the main reach of Hinkson Creek.

   B. Pervious pavement and underground detention are being installed at the Columbia City Hall development and redevelopment along the Flat Branch, which is a tributary to the Hinkson Creek.

C. Pervious pavement and a large bio-retention cell was installed with the help of grants at the City's new Fire Station No. 7, which discharges to Mill Creek, which is in the Hinkson Creek watershed.

D. Rain gardens were installed on the Harvard Drive Rehabilitation project, which discharges to County House Branch, a tributary to the Hinkson Creek.

E. MKT Trail Head Park redeveloped a former industrial area in downtown Columbia, removing contaminated soil and stabilizing stream banks with large rocks and planting. A rain guard was installed in the most recent phase. These all impacted the Flat Branch, which is a tributary to the Hinkson Creek.

CITY SANITARY SEWER CHANGES IN THE HINKSON CREEK WATERSHED

1. The City has implemented sanitary sewer changes that have benefited Hinkson Creek, which include the construction of interceptors that eliminate small treatment facilities and performed pipe and manhole rehabilitation projects. They include:

   A. The South Grindstone Interceptor and the Lake of the Woods Mobile Home Park Lagoon Interceptor removed several small treatment plants from the watershed and connected them to the City's sewer system. These were in cooperation with the Boone County Regional Sewer District.

   B. The City has implemented a program involving cured-in-place linings of old pipes and manholes. These projects stopped sewage from leaving old systems as well as preventing overflows by preventing storm water from entering the system.

   C. The City has undertaken an effort to eliminate "private sewer systems" that were prone to bad repair and overflow problems. An example is the Sewer District 154 Project in the Flat Branch watershed, which eliminated 20+ acres of failing sewers. The City has methodically taken over and rehabilitated private sewers that especially impacted the Hinkson Creek system.

2. The City has a history of eliminating wastewater treatment plants and direct discharges to Hinkson Creek. These include both City plants and County plants in an effort to improve the watershed. This began in the early 1970's and continues to this day.

EXHIBIT C

UNIVERSITY OF MISSOURI
ACTIONS TO ENHANCE HINKSON CREEK WATERSHED
POST 303(D) LISTING

1. Best Management Practices at the University Power Plant in conjunction with its NPDES permit have resulted in extremely low Total Suspended Solids (TSS) in spite of the Power Plant sitting directly on the Flat Branch, which is a tributary to the Hinkson Creek. A comprehensive street sweeping program at the Power Plant takes place every day coal is delivered, and there are numerous controls that have been established at storm sewer inlets in the area near the Plant.

2. Each of the University's large aboveground fuel storage units has individual NPDES permits, which require strict controls on discharge of storm water that accumulates in secondary containment. The University continues its history of having no illicit discharges from any of its AST's. The University has three Spill Prevention Containment and Control Plans covering parts of the watershed. These plans provide formal procedures to prevent release to waters of the state of any oil products, which include both inorganic and organic oils and fats.

3. All construction on the University Campus is coordinated by a designated land disturbance permitting authority on the campus. The campus has dedicated employees that provide weekly and post-rain event inspections on all University construction for compliance. Additional inspections are provided by University Environmental Health and Safety, and audits are conducted of all open land disturbance events.

4. The University's Master Plan for the entire campus, which is reviewed and revised annually, incorporates storm water concerns. All campus storm and sanitary sewers are mapped and are in the process of being inspected via in-line cameras.

EXHIBIT D

COUNTY OF BOONE
ACTIONS TO ENHANCE HINKSON CREEK WATERSHED
POST 303(D) LISTING

Boone County has taken significant administrative steps to pass ordinances, including stream buffer protection, that directly impact the quality of Hinkson Creek. None of these appear considered in the TMDL.

1. The County has passed a stream buffer ordinance. This ordinance has a setback requirement depending on stream size. Streams are categorized by USGS topographic maps. Blue line streams are categorized as Type 1 streams. They are required to have a setback of 100 feet from the ordinary high water mark. Type 2 streams (USGS-blue lines) and Type 3 streams (unmarked tributaries with drainage areas greater than 50 acres) have 50-foot and 30-foot setbacks respectively. Each of those setbacks is divided into two zones. The stream-side zone or "no-mow" zone is for undisturbed native vegetation. The outer zone can have managed landscape areas but no new structures. The ordinance went into effect in the county in 2009. The ordinance is not retroactive, but will prevent new structures from being built adjacent to the creek and increase stream bank vegetation and stabilization.

2. The County is in the final stages of a public review of a storm water ordinance that addresses the consequences and impacts of urban runoff and protects waterways from storm water-related pollutant load.

3. The county ordinance is based on the Center of Watershed's Protections model ordinance. The County uses a nested approach to storm water management to treat different runoff volumes. The details of the county ordinance, which is currently going through appropriate public participation, can be found on the County's website.

EXHIBIT E

ACTIVITES BY PRIVATE OR QUASI PUBLIC AGENCIES TO ENHANCE HINKSON CREEK WATERSHED POST 303(D) LISTING

1. The County has partnered with the City of Columbia and the University of Missouri on a 319 project in the Hinkson Creek watershed. The restoration project is updating the watershed management plan so that all of EPA's nine key elements are included. The project has developed a feasibility study to examine and provide cost estimates for retrofitting areas in the impaired section of the Creek. The next step in the 319 grant is to approach landowners to cost share the placement of retrofits that will reduce peak flows to the Creek in the impaired section.

2. The City, County, and University have worked cooperatively on clean-up activities. The last event was held on October 17, 2009. Over 400 local citizens volunteered at least two hours of time to clean up Hinkson Creek and remove debris.

3. University hydrology study of the Creek was initiated in 2008. The researcher has collected data for about one year. That data will be extremely helpful in the triage process, enhancement of the TMDL strategy, and validating the changes in the watershed due to the storm water ordinances and stream buffer regulations. It will assist in providing baseline information.

4. The Missouri Department of Transportation has relocated salt domes and distribution facilities. The facilities were formerly located off Conley Road on the banks of Hinkson Creek. They have been relocated with state-of-the-art storm water control structures. Chlorides have long been a suspect of concern, and they have had a major source removed.

5. Columbia Country Club has provided greater buffer zones along its golf course adjacent to Hinkson Creek.

6. The Conley Road Transportation Development District has constructed significant detention, treatment, and control facilities in an area suspected of impacts to Hinkson Creek. The area has significant parking lots with large impervious square footage and substantial roof structures.

Columbia Annexation Map

Ben Londeree to: anne.peery 10/10/2009 02:49 PM

Anne,

This is a follow up on our discussion on Tuesday of this week about use of Columbia's land area as an independent variable in the TMDL study. I have provided a link to a map of Columbia's annexation history. On that site you can click on a link to a table showing the precise area of each annexation from 1826 to 2005. Note that in 1969, the area nearly doubled. Most of this annexation was open land that developed over the following 20-40 years. Also, note that a lot of the land that was developed in the 1990s north and south of the I-70/63 interchange was annexed in 1962 and 1964. From 1961 to 1966 the area of the city doubled and then nearly doubled again in 1969. From 1969 to 2005 the area of the city only increased by 50% from 41.5 square miles to 60.6 square miles. I think that most of the annexations from 1990 to 2009 have been voluntary for specific developments.

The second URL contains reports on building permits issued from 2002 to 2009. The third URL is a housing analysis study that includes 2000 census information and building permits issued in 2000-2003. A table based on the 2000 census includes the number of homes by decades back to 1940. Perhaps the number of permits and number of houses by decade could serve as a better surrogate for increase in impermeable cover. Perhaps your team could find even better data than I have provided here.

Ben

http://www.gocolumbiamo.com/Planning/Zoning/anex_history_map.php

http://gocolumbiamo.com/PublicWorks/Inspection/AnnualConstructionReports.php

http://gocolumbiamo.com/Planning/Documents/chapter_2.pdf

FW: Summary of Volume Reduction (2008)

Ben Londeree to: anne.peery 10/16/2009 12:34 PM

History: This message has been forwarded.

Anne,

I am forwarding the response that I got about my inquiry about a summary of volume reduction research.

In addition, I would like to be involved in the discussions between DNR and local stakeholders (city, county, university, developers, and other stakeholders) mentioned in the press release about a delay in the TMDL document. I believe that a reasonable volume reduction goal is worthy and should be a part of the final TMDL. It should be based on the latest scientific information. However, correction of flashiness also should involve use of other BMPs to drastically reduce the rate of release from areas of increased imperviousness – both past development and future development.

Thank you,
Ben Londeree

From: Jane Clary [mailto:clary@wrightwater.com]
Sent: Friday, October 16, 2009 10:01 AM
To: Londeree, Ben R. (Emeritus)
Subject: RE: Summary of Volume Reduction (2008)

It should be finalized within the month. We will send you a copy.

Jane Clary

Sent from my Blackjack

From: Ben Londeree <londereeb@missouri.edu>
Sent: Tuesday, October 06, 2009 1:52 PM
To: Jane Clary <clary@wrightwater.com>
Subject: Summary of Volume Reduction (2008)
Ms. Clary,

I visited your BMP performances web page and was interested in when the Summary of Volume Reduction (2008) will be available? Our community just received a TMDL directive from Missouri DNR to reduce the volume of stormwater runoff by 68%. Your organization's review of this area is of very much interest to us. Thank you.

Ben Londeree

Volume-Based Hydrology | stormh2o.com

Ben Londeree to: anne.peery 10/21/2009 09:14 AM

History: This message has been replied to.

Anne,

I may have sent this to you before. However, there are four comments that may not have been there before.

Ben

http://stormh2o.com/september-2009/volume-based-hydrology.aspx

UNIVERSITY *of* MISSOURI

ENVIRONMENTAL HEALTH AND SAFETY

Scott Totten
Acting Director, Water Pollution Prevention
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Mr. Totten,

We are writing you on behalf of the City of Columbia, Boone County and the University of Missouri as a follow up to the TMDL informational meeting held October 20, 2009 at the Boone County Government Center. At the meeting, the joint holders of the Boone County/City of Columbia/University of Missouri MS4 permit agreed to provide a suggestion for the next TMDL draft.

Todd Houts, Assistant Director, MU Environmental Health and Safety, emailed information on the use of phased TMDLs to Leanne Tippett Mosby, then Director, WPP, the following day (Attachment 1). In that letter he noted that even with a phased approach, the TMDL must include a Waste Load Allocation (WLA). The City, County and University have met to craft the following proposal:

> The joint holders of the MS4 propose the department's next draft TMDL incorporate a Phased TMDL, the components of which will be further study, and a modest volume reduction goal of 5% for the 1 year average annual storm as determined by existing stream gauge data.
>
> The study should include macroinvertebrate sampling in the spring and fall at various sites along Hinkson Creek along with studies of sediment in the macroinvertebrate habitat. The implementation plan should include a reasonable timeframe to meet the 5% runoff volume reduction for the 1 year average storm.

We appreciate the willingness of the Department to work with the City, County and University to craft a TMDL that helps all parties work toward restoration of the Hinkson Creek to water quality standards.

Sincerely,

Karen M Miller	John Glascock	Peter Ashbrook
Boone County	City of Columbia	University of Missouri

cc: Signatories
John Hoke, MDNR
Leanne Tippett Mosby, MDNR
Steve Hunt, City of Columbia
Bill Florea, Boone County
Todd Houts, University of Missouri

Attachment 1

From: Houts, Todd A.
To: leanne.tippett.mosby@dnr.mo.gov; scott.totten@dnr.mo.gov; rob.morrison@dnr.mo.gov; john.hoke@dnr.mo.gov
Cc: Hunt, Steve; tewellma@gocolumbiamo.com; sshawver@boonecountymo.org; gbowman@boonecountymo.org; bflorea@boonecountymo.org; kmiller@boonecountymo.org; dhaid@boonecountymo.org; dcampbell@boonecountymo.org
Subject: EPA Guidance to Phased TMDL and Applicability to Hinkson Creek
Date: Wednesday, October 21, 2009 6:17:00 PM

Please note I have sent this email only to DNR staff and my colleagues at Boone County and the City of Columbia…

DNR Staff,

Thank you for the meeting yesterday. I know I sometimes come across overtly critical, and I do apologize for that, but it stems from my passion about the regulatory process. I'm one of those people that likes rules and the clarity they can provide for courses of action. Yesterday, among others, I came back to the need for a pollutant to be identified as the required first step in the TMDL process. However, as I continue to research the evolution of these rules, I found that in 1999, EPA proposed revisions to the TMDL process that would expand the listing process to pollutants and pollution, but it appears it was either never finalized or withdrawn.

I do find, however, in EPA guidance specific to the 1998 list (where the Hinkson was ultimately added) http://www.epa.gov/owow/tmdl/lisgid.html that (emphasis mine):

> Waterbodies Impaired by an Unknown Source or an Unidentified Pollutant
>
> 40 CFR section 130.7(b)(1) provides that waterbodies included on State section 303(d) lists are those waterbodies for which pollution controls required by local, State, or Federal authority, including technology-based or more stringent point source effluent limitations or nonpoint source best management practices, are not stringent enough to implement any water quality standard applicable to such waters. In addition, 40 CFR section 130.7(b)(4) requires States to identify, in each section 303(d) list submitted to EPA, the "pollutants causing or expected to cause violations of the applicable water quality standards."
>
> These regulatory provisions apply even if the **source** of the pollutant cannot be identified at the time of listing. Therefore, for the 1998 listing cycle, waterbodies impaired by an **unknown source** should be included on 1998 State section 303(d) lists, as **long as there is a pollutant associated with the impairment**. Listing may be based on pollutant loadings from unknown point and nonpoint sources, and includes situations where a pollutant is found in fish tissue such that there is an exceedance of applicable water quality standards, but the pollutant is not traceable to a particular source.
>
> In addition, 40 CFR section 130.7(b)(4) requires States to include on their lists an identification of the specific pollutant(s) causing or expected to cause exceedances of applicable water quality standards. In some situations, however, **a specific pollutant has not been identified at the time of listing**. Therefore, for the 1998 listing cycle, where a water is impaired but a specific pollutant has not been identified, States should, if possible, indicate on the 1998 State section 303(d) **lists the class of pollutants** (e.g., metals or nutrients) causing, or believed to be causing, the impairment. Moreover, for the 1998 listing cycle, States should indicate whether the water is impaired for one or more pollutants.

Clearly, EPA's intent is that a pollutant be identified, and while the final paragraph includes "if possible", the expectation was that a pollutant class be listed. However all these rules about listing (which do allow listing without pollutant information) do not disallow the later requirement of the presence of an identified pollutant being the first step in the TMDL process.

I've continued to research issued TMDLs and cannot find any non-phased TMDLs issued for unknown pollutants. Many waters have been listed for "unknown" but either the pollutant was identified by time TMDL was issued or a phased approach was used.

EPA SUPPORTS PHASED APPROACHES TO TMDL WHEN…
--significant data uncertainty is present; or
--when using a surrogate to interpret a narrative standard; or
--when uncertainty about the effectiveness of implementation activities exists

The above bulleted list is my summary of EPA's "Clarification Regarding 'Phased' Total Maximum Daily Loads"

http://www.epa.gov/owow/tmdl/tmdl_clarification_letter.html

…which in the heart of the document reads (emphasis mine):

> *Phased TMDLs*
>
> We recommend the use of the term "phased TMDLs" be limited to **TMDLs that for scheduling reasons need to be established despite significant data uncertainty** and where the State expects that the loading capacity and allocation scheme will be revised in the near future as additional information is collected. In other words, phased TMDLs would be reserved for the second scenario described in the 1991 Guidance. (TODD HOUTS NOTE: Second scenario = Guidance recommends the phased approach for situations where available data only allow for "estimates" of necessary load reductions or for "non-traditional problems" where predictive tools may not be adequate to characterize the problem with a sufficient level of certainty.)
>
> The phased TMDL approach would be used in situations where limited existing data are used to develop a TMDL and the State believes that the use of additional data or data based on better analytical techniques would likely increase the accuracy of the TMDL load calculation and merit development of a second phase TMDL. **Such significant uncertainty may arise, for example, because the State is using a surrogate to interpret a narrative standard,** or because there is little information regarding the loading capacity of a complex system such as an estuary and it is difficult to predict how the a water body will react to the planned load reductions. An example of a phased TMDL could be a TMDL for phosphorus in a lake watershed where there are uncertain loadings from the major land uses and/or limited knowledge of in-lake processes. In such a case, the loading capacity of the water body may be difficult to establish and the State may decide to include a schedule for establishing a revised TMDL based on follow-up monitoring. Phased TMDLs may also occur when a revision of the applicable standard is underway and will necessitate development of a second phase, revised TMDL to comply with the new standard.
>
> All phased TMDLs must include all elements of a regular TMDL, including load allocations, wasteload allocations and a margin of safety. As with any TMDL, each phase must be established to attain and maintain the applicable water quality standard.[viii] In addition, EPA recommends that a phased TMDL document or its implementation plan include a monitoring plan and a scheduled timeframe for revision of the TMDL. (These elements would not be an intrinsic part of the TMDL and would not be approved by EPA, but may support a rationale for approving the TMDL. See also "Nonpoint Source Program and Grants Guidelines for states and Territories, Federal Register Vol. 68, pp 60653-74.)
>
> Since phased TMDLs will in all likelihood need to be revised and therefore require more overall effort, **States should carefully consider the necessity of such TMDLs, for example to meet consent decree deadlines or other mandatory schedules** Upon revision of the loading capacity, wasteload, or load allocations, the TMDL would require re-approval by EPA.

TMDLs with Adaptive Implementation and Trading Provisions

Adaptive implementation is an iterative implementation process that makes progress toward achieving water quality goals while using any new data and information to reduce uncertainty and adjust implementation activities. The National Research Council report suggests that adaptive implementation include "immediate actions, an array of possible long-term actions, success monitoring, and experimentation for model refinement".[ix] By using the adaptive implementation approach, one can utilize the new information available from monitoring following initial TMDL implementation efforts to appropriately target the next suite of implementation activities.

Phased TMDLs are an example of the adaptive implementation approach because each new phase utilizes new information to reevaluate the original TMDL. However, even for TMDLs where there is little uncertainty regarding the loading capacity of the water body and the necessary load reductions, an adaptive implementation approach can be a useful tool. Implementation of TMDLs can take many years and **when uncertainty about the effectiveness of implementation activities exists, TMDLs would benefit from containing elements that would facilitate adaptive implementation such as, for example, provisions for a flexible load allocation/waste load allocation scheme.** EPA is currently working to clarify how TMDLs can be written to provide for adjustments in the load and wasteload allocations in approved TMDLs.

EPA understands that not all TMDLs can be implemented using adaptive implementation methods due to the more intensive monitoring and added administrative steps associated with this iterative approach. Nonetheless, EPA believes that in appropriate cases it should be feasible for States to develop TMDLs that facilitate implementation of practicable controls while additional data collection and analysis are conducted to guide implementation actions. **Follow-up monitoring is integral to the adaptive implementation approach.** Monitoring addresses uncertainty in the efficacy of implementation actions and can provide assurance that implementation measures are succeeding in attaining water quality standards, as well as inform the ongoing TMDL implementation strategy. If adaptive implementation activities reveal that a TMDL loading capacity needs to be changed, the revision would require EPA approval. In most cases adaptive implementation is not anticipated to lead to the re-opening of a TMDL. Instead, it is a tool used to improve implementation strategies.

An example of a phased TMDL
Mississippi TMDL (unknown pollutant) – phased approach for further studies (was also subject to movement under consent decree); cannot determine if EPA ever responded:

http://www.deq.state.ms.us/mdeq.nsf/pdf/TWB_TurkeyToxicityMar03/$File/YazooRBTurkeyToxicityMar03.pdf?OpenElement

In regards to Joint MS4 permit holders (and I haven't yet had time to thoroughly review this 200 page document), I hope the department remains cognizant of both the current general MS4 permit (under which we are still legally bound), the relationship between NPDES permits and TMDLs and this recent EPA guidance document:

http://www.epa.gov/owow/tmdl/pdf/tmdl-sw_permits11172008.pdf

BOTTOM LINE

The department's press release for the withdrawal from public comment the Hinkson TMDL contained a statement credited to Leanne: "This is the first TMDL in Missouri to address an unknown pollutant and an urban stream, which makes the process a little more difficult," said Leanne Tippett Mosby." *First TMDL in Missouri* implies TMDLs for unknown pollutants have been done elsewhere. If that is the case, I would appreciate an electronic reference to this.

If this is not only the first in the state but also in the nation, then it begs the question "why has this not occurred elsewhere?" The obvious answer is because without a pollutant, the TMDL process can't proceed. However, facing the reality that the department is backed into a corner at this point by time constraints, then giving serious consideration to issuing a phased TMDL, that allows the department (or someone) to continue to study the Hinkson – but which does include a nominal WLA (to meet minimum requirements of the TMDL) would allow the department to address the many concerns raised at yesterday's meeting, would allow the department to meet their legal obligation and would allow time for all parties to work together to restore the Hinkson to water quality standards.

Thank you for your time,

Todd Houts

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