

Highlights From the September 30 Stakeholder Advisors Meeting – DNR Thresholds Project

The DNR hosted the second meeting of the “Groundwater Thresholds Project Stakeholder Advisors” on September 30, 2015 at the Golden Valley City Hall. The meeting was open to the public. There were about 40 people in attendance.

The meeting included four presentations, as listed below. What follows is a summary of the discussion following each presentation. Stakeholder and audience comments are marked with a ‘dot.’ *Italics* indicate answers to questions. Note that this summary is only intended to capture key elements of the discussion, not as official meeting minutes.

Greg Spoden – Climatology – and Greg Kruse – Hydrology – presentations

Discussion:

- Dryness in western MN due to flatness, clay? Does map reflect surface and groundwater? *The relative dryness in western MN has to do with the amount rainfall and evaporation. Yes, the map reflects inflow and outflow – both surface and groundwater are reflected.*
- Depth of clay is noticeable out there. Wells are deeper because of thick clay and take longer to recharge.
- How many sites is average rainfall based on? *All sites – 150 stations statewide (2 per county)*
- How many inches do we lose through evaporation (of 1 inch per acre)? *About ¾ to ET, about ¼ to runoff, about 2% goes to recharge (per pie chart)*
- In other words, very little recharge? *Yes*
- So, if we see the hydrograph rebounding, where is the recharge coming from?
- How has precipitation changed over time: will warmer temps increase ET? *Most of the warming we have seen in MN has been winter nighttime temps, so not impacting ET yet – the future may see temperature shifts during growing season.*
- The 2% recharge seems critical – how has it shifted through time? *Recharge is complicated – see USGS publication – We’ll provide some detail on this topic at next meeting. Essentially, recharge is a mathematical remainder in this formula.*
- What about rainfall trends across longer historical period? *Very favorable ag conditions now, compared to 1930s.*

Ian Chisholm – Streams Presentation

Discussion:

- A constant percentage is proposed (15%) - is there a point at which no withdrawals are available? *Yes, we think the “Q90” flow is that threshold.*
- How can you test for the 15% - is it just a compromise? *We’re testing it based in impacts on fish, and examples of other states/nations.*
- There can be impacts at lower levels. Problem with using the same % for cold and warm water streams – one size fits all approach. Cold water base flow is almost all groundwater, so 15% reduction in it could have huge impacts (on trout streams). *We are applying it to the hydrograph, so there is a variation based*

on the individual stream systems – an open question is whether same % applies to cold/warm water streams. Trout streams also further protected in statute.

- *Studies based only on warm water systems? No, info from across the state. Threshold research is worldwide.*
- *Depletion only, not impacts of increases? We're focusing on depletion, but impacts go both ways.*
- *Are you looking at ecosystems that are there now, or those present in past? We look at what's currently available, but are not trying to preserve degraded conditions. Fish will use the entire watershed they have access to for different parts of their life cycles*
- *Has it been proven chemically that GW influences SW? Why are we concerned with altering such a small % of change? We are exploring how much additional change we can add to the changes that are already being made.*
- *Nice job of presenting about % flow – how comfortable are you with Q90? As a simple limit Q90 doesn't work well, but in conjunction with a flow measure it can work well. As you get to the low flow months or drought conditions, could end up taking most of stream flow without the Q90.*
- *How do you determine how far up the stream to go? How far away from the stream do we go? There is science about "stream depletion" to help determine that using synthetic hydrographs.*
- *How do you apply this approach equitably across an aquifer without picking out winners and losers? We monitor to detect impacts of pumping for a certain distance. But wells further away can have greater impact – where use becomes more intense, we need to develop more detailed models.*
 - *We may have multiple allocations across landscape, the amount of data and quality of models varies. All relate to the effect on flow – how we apply the thresholds through individual permit decisions. For a given watershed, we need to predict certain areas to model, then monitor and adapt over time.*
- *How many streams do we have 15% of mean August flow calculated for? Not many yet – are working on synthetic hydrographs. These data will be most important in the locations experiencing the highest intensity of use. In other words, we don't need these data everywhere.*
- *How do you assess whether the % of withdrawal is too much – fish turning up dead? For the streams we've looked at, 15% results in 8 – 15% avg loss of habitat. Hope to adjust as we go to not be too restrictive or too permissive.*
- *Who defines impact? For how long? We have a lot of detailed information about change in process, structure, and function of the streams – research is pretty strong about the changes and negative impacts.*
- *In cold water systems, temperature is a critical feature, even if habitat is changed or not, temperature is very sensitive feature for trout streams. Yes, temperature is vital, need additional research.*

Dave Wright – Lakes presentation

Discussion

- 1990 is date of small lakes (<500 ac.) restrictions – prior to groundwater linkage. Was designed to be a surface water appropriation priority, and you're now trying to apply it to GW. Is that appropriate? Maybe the "discourage" language should be changed.
- Crosslink in legislation 2010 discouraged use of small lakes. Is it still appropriate to protect small lakes from groundwater appropriation? *Yes, we need to continue to talk about it.*
- Don't hear anything about recharge – assume we'll get rain. *As with rivers – the desire is to protect the "natural pattern." Challenge – can we lower the high flows and lower the lows without impacting the habitat and recreational values too much?*
- How many of our lakes are connected to groundwater? *In Groundwater Province 4 (central sands part of the state), there's a high likelihood they are connected.*
- Also noted the outflow streams that have their own thresholds (15%) – which threshold counts?
- How can we make an exception for the lakes that have been flooded for the past 20 years? *We haven't been vigorously enforcing the ½ acre foot limit in statute. In some lakes, 2 ½ feet wouldn't make a difference. Statute encourages use of water when more seasonably available.*
- Need to make exceptions more solid in statute. Don't enforce selectively.
- Are we suggesting a change in appropriation priorities? *No, this project is not addressing the priority of water users.*
- Limits based on a 1960s snapshot of lakes (Bulletin 25, 1968) following drought years– how did climate and precipitation affect the lakes' size/shape? *We recognize conditions have changed, but it's the Legislature's prerogative to call for a change in this "tool".*
- Did lakes analysis take land use into account? *No, just size of drainage area.* In establishing protective elevations, would you look at land use? *Yes, would have to if we set protection elevation e.g. forested vs. developed watershed.*
- What does proximity to lake mean in this context? *Meant to be hydrologic proximity – varies by the local geology.*
- How would you define proximity for each type of lake? *Modeling in areas of concentrated use – White Bear Lake (USGS), Little Rock Creek (DNR), Dakota County (USGS), GWMA's, etc. We can give people the factors that would go into the model.*
- Would DNR do the modeling or someone else? Can someone challenge the model? *It's a mix. If DNR develops model, we will invite other experts to review. Models can be constructed to answer different questions – we need them to answer specific questions. If someone wants to challenge a permit decision, there's a process. Rochester hired Barr w/ DNR as tech advisor.*

Doug Norris – Wetlands presentation

Discussion

- Are we trying to maintain the present or go back to some point in the past? Seems inconsistent with streams approach. *We know what kind of wetland should be there given hydrology; we want to support*

hydrology that would support native plant communities, even if invasives are now there through disturbance.

- Where does the “green zone” end? It seems to vary a lot. *The numbers are just examples; a real example would actual elevations on scale – inches below surface, translated into water quantity.*
- How do you determine if a wetland is connected to a specific GW source? *The first step is to determine whether the groundwater aquifer is connected to the wetland through monitoring wells, etc.*
- If we assume everything is connected, which resource takes precedence: a lake, stream or wetland? *Figure out relationships, and determine which one is most affected – i.e., the most sensitive or directly affected one. We have all these resources in every combination; need to take a watershed approach.*
- Are you going to allow yourself to vary the standards? *Our approach is to use long-term data and statistical models that keep the long-term ecological dynamic (in short cycles, a species might lose but in long run, species can come back).*
- Stormwater (MS4) requirements for cities may put them in conflict with infiltration requirements and wetland impacts. Increasing infiltration could reduce runoff, which could lower surface water levels. In areas of high impervious coverage, could see unintended reduction of groundwater appropriations. *With interconnectedness of surface/groundwater, lack of runoff may be offset by increased recharge to aquifer. Intent is to keep improving the quality and quantity of surface water recharging it.*
- Concerned that one regulatory activity doesn’t create an additional regulatory “hammer.” Example of communities like Eagan with sensitive wetlands and conflicting mandates from different agencies. *We will try to reflect this in the report – will need to talk more with you (LMC).*
- Thresholds (i.e., numbers) need to be in rule rather than statute so we can have more flexibility to adjust over time. *Our challenge is to articulate the approach that meets the desire for statutory clarity and necessary flexibility.*
- Are all wetlands included in scope? Yes. Is there a de minimus? Yes.
- What about wetland types 1/2? *Many are not connected to groundwater – for those that are, we need to determine the “critical time” to set the green/yellow/red exceedance values.*
- Have you considered excluding types 1/2? *Possibly – type 2 are complicated; (ephemeral seasonally flooded wetlands). Critical seasonal period may be in spring.*
- What did you mean by “long-term plant community”? *Many wetlands have their own long-term cycles. We want to recognize that many wetlands are relatively stable – it’s the hydrologic connection that “maintains the normal cycles.”*

General Discussion

- Cold Spring Brewing – if there’s a modeled Q90 and you determine a 15% threshold, how often do we measure and re-evaluate the stream?

Through monitoring and modeling we would determine the August mean low flow (about 2 cfs) based on gage data so far, then derive 15% and tie back to GW appropriations through a GW model; evaluate temperature of system, determine a sustainable diversion limit – then, who gets the water?

Figure out who is using it, then align the users in priority: domestic, brewing, irrigation, golf course.... if there is enough for all users – then no problem. If there is not enough, then we have to allocate.

- *It's not practical to revisit every permit on an annual / intra annual basis – instead, we might be able to manage the infrequent “dry periods” using something like the Palmer Drought Index as a trigger for temporary reductions in water use.*
- *What about new users coming in? As a riparian rights state, can't necessarily restrict use to prior appropriations – cities need to carefully consider how many water-intensive uses should be encouraged in community.*
- *How do we also recognize in the Cold Spring case the ability to use nitrate-polluted water? Polluted water is not unique to just Cold Spring. Contamination and plume management in Cottage Grove affects those communities as well. Each situation has unique challenges that need to be considered. Similar case with benzene in Paynesville.*
- *How much consideration about sump pumps, watering bans, tiling systems? Sump pumps – very localized issue primarily for local government. Drain tiles – concerns about recharge – not very much data available about impacts of pattern tile drains on recharge. Permits not required for sump pumps or drain tiling.*
- *When / how are we going to prioritize water use – e.g. Lake Carlos – lawn watering using lake water. Governor can declare a drought emergency and ban practice – otherwise the practice is legal, and not regulated by the state.*
- *With all the competing demands, how long does it take for DNR to determine how to evaluate a permit (if modeling)? Does DNR have the organizational and staff capacity? We are doing this in several areas using increased funding from Legislature – we are developing the models in areas of intensive use; being deliberate and science-informed.*
- *How does Little Rock Creek area compare with the GWMA's in size? Will you be modeling the entire Bonanza Valley? BV has about three distinct areas within it – it's likely that we would build one model with three distinct areas. LRC is much smaller than BV. The USGS is doing modeling in the North & East Metro. The N&E Metro also has several sub-areas to model.*
- *Will models help inform other planning procedures – One Watershed One Plan, community Water Supply Plans? Yes – that's what we hope to do.*

Presentations on Appropriation Permitting and Groundwater Technical Evaluations were deferred until the next meeting on October 21.