



HAMILTON COUNTY WELLHEAD PROTECTION LOCAL PLANNING TEAM MINUTES



Conference Room 1A – Hamilton County Judicial Building

September 22, 2020

The meeting was called to order Tuesday September 22, 2020 at 2:05 PM.

Those present were as follows: Mr. Kenton Ward, Hamilton County Surveyor; Mr. Gary Duncan, Hamilton County Surveyor's Office; Mr. John Havard, Citizens; Ms. Morgan Bennett, Hamilton County Health Department; Mr. Tim Stottlemeyer, City of Noblesville; Katie Jamnska, Indiana American Water; Mr. Jack Whittman, Intera; Mr. Siavash Beik, Christopher Burk Engineering; Mr. John Stolz, ; Mr. Andrew Pappas, Ms. Christina Gosnell and Mr. Jeffery Willman.

Presentation – Central Indiana Water Availability Report:

The forecast of withdrawals is for the nine (9) surrounding counties of Indianapolis including Marion County. The peak for the history of water use shows energy production in the nine-county region in the range of 500,000,000 gallons per day at the peak around 2000. It has fallen to about 50,000,000 per day because of the way we're changing our fuel sources for car generation. It's expected to be lower in the future based on what we can gather. We projected all of the different users. The next line down is public water supply and the line we forecast is the middle line if you were to project it back in time through those up and down years. Wet years where the demand is lower and dry years where the demand is higher. 2012 doesn't show up as a blip, it was a wet and dry year both from total water use prospective. The forecast was driven by the population in the nine-county region and it's expected to grow from now until 2070. The total use of water in 2070 over an average year is going to be 500,000,000 gallons per day for the region and half of that is public water supply. Today we're more than 100,000,000 gallons lower than that. Our total increase is going to go up. 25% of our total we're using now is going to be added to our demand by 2070. Today it all comes out of the wells and intakes in the nine-county region. Hamilton County is the second largest total water user. In 2070 the annual average use will be 95,000,000 gallons per day from Hamilton County. If we look at the service territories for the utilities in the nine-county region and look at where that expected change is going to be the most and where it will be the least the red shows a change but it will be decreased so Anderson will have lower demands in the future than today, but Hamilton County has the highest increases, over 100% in some of the utility areas. This is based on projections on population over time in these regions. This is only looking at public water supply, but other uses of water also increase, and mining is one of those. We only report annual averages and how they will change. In addition to that we looked at seasonal variation and how much that annual average is deviated from in the normal year. In 2070 we saw that the peaks are expected to be in the monthly peaks of almost 350,000,000 gallons per day only for public water supply and the low time of year will be in the 180,000,000 gallons per day. In addition to standard seasonal variation we looked at several climate change scenarios. We looked at hot/dry, warm/wet and a 30% drought. Using those scenarios, we looked at how the seasonality of water demand could change over time. If climate change happens the monthly totals would maybe go another 40,000,000 gallons per day higher.

Is there enough water in the region to meet the future demands?

We had to define what available water is. Water availability changes from place to place, seasonally, it changes whether your talking surface water or ground water, etc. and had to evaluate the spatial and temporal variation in a period where we had enough data to calculate what is available and project that into the future to see how that changes over time. There are sections of river that flow through and are part of the White River tributary system and there are 13 sub watersheds where we have a USGS gauge above it and below it and we know all of the water that's' been taken out by wells and diversions and put

back by MPDS discharges. The same goes for the Wabash water system which is on the northwest side of this. It's also true with the East Fork of the White River where we have eight sub-basins. We had to calculate based on the data we had on inflows and outflows what amount was available after people had taken the water they had used. Stream gauges are critical to doing this kind of work. If we added a gauge to the middle of the top (green 3) we could get much more resolution in that one large basin and understand better what's going on up there, similar for five. For each one of these we could compute the amount of water inside and how much moves out. For each one except the very top one there are surface water inflows from the sub-watershed that's upstream. There are surface water return flows that are computed and are regulated so we have numbers for monthly return flows for all of the permitted dischargers. We also have surface water withdrawals that are taken out for public supplies or other purposes. We have storage inside of a basin that holds water and can release water but also is a part of the available water for the system. We have pits that are basically stored water in the aquifer. You have losses from evaporation, you have precipitation that becomes recharge. We had all the groundwater withdrawals that DNR records as part of their significant water withdrawal database. In addition, we have groundwater inflows that come across any basins that might be in there and the outflows. With all of these numbers we can calculate what the values are within the basins. The additional demand is different in Hamilton County in that it has an increase in demand on the public supply side, but there's a competing industrial use which is dewatering related to mining operations in the county. In some cases, it's clear that the mining competes with the public supply for the same water. To complicate this, even though there's more data than most other counties the data is very sparse away from high capacity wells and there's not that much information water levels or water level changes in the larger county. Hamilton Seven Well and Hamilton Nine Well are monitoring wells. Hamilton Nine Well you can see there have been changes, but no one has been able to explain why the changes have occurred as they have. In Hamilton Seven Well there have been variations and there are trends that might last for several years. Do we have enough knowledge and understanding to take action? The data needed to figure out how to manage the resource are (these data); the State has done a good job collecting monthly water use information from the significant water withdrawal facilities, but there are peaks in the month that probably need to be explained because the data on water levels we have are fairly high frequency. We need that similar frequency on public water supply wells so we can better operate and manage that withdrawal. In order to do that you need metering on public water supply wells. The other thing that needs to be metered is you need to know the same thing about the mine dewatering per day so you can better describe how the system behaves. You also need water levels and inflow rates into all of the basins and ponds. You could measure and should potentially measure flow directions in monitoring wells in a few locations, so you know that water is switching direction between pumping centers or between the river and the pumping wells during the high flows and low flows. Real time water levels in the aquifer and water temperature would be another good thing to measure just because it changes especially near the rivers. You also need the water levels in the aquifer near the well fields. You need surface water flows at the gauges, you have that, but also need stages in all of the rivers and smaller reservoirs like the neighborhood pits and ponds. We have developed a local ground water flow model that could be used for interpretation so that could be plugged into this, not run by us, but at the State level. To manage the system, you need reports. You have to interpret all this data. Are there trends we need to worry about, are there changes in water quality we need to think about, and you need a dashboard that helps you understand that. We drove piezometers through the streambed along the river through the region to see how well connected the river was to the aquifer as the wells nearby were pumping so you have an insight that the gradient is from the river into the aquifer next to the big pumping well so you've got a downward gradient. We put those piezometers in and measured how the thermal flux, the diurnal change in temperature that goes up and down every day, that little sign wave of warmer and cooler water can be tracked as it goes through the sediment into the aquifer and by knowing that you can estimate the hydraulics of that zone between the river and the top of the aquifer. One of the places we tried to punch holes was not possible to punch the piezometer through was downstream of where the discharge water from the mine that has some limestone suspended sediment in it armored the bottom of the river. When we moved far enough away from it where we could get the piezometer through the sediments into the aquifer the water levels were much lower than the river, way lower. There's a gap that was created because the isolation of the river from the aquifer caused the aquifer levels to fall because they couldn't induce recharge into the aquifer because of that cemented material. This happens naturally, it happened near Louisville when they built their first collector well, but they were pumping at 25,000,000 per day and that's not what we're talking about with these wells. All of these data are not that hard to collect and even

easier if we can come up with a method that has a few widgets engaged or used to provide this information. Today, I'm just trying to explain the general story of the whole region and how it applies to Hamilton County. There are other companies, but Intel has sorted this problem out of water levels in monitoring wells and feedback in a cheaper way than having another USGS well. What you need are twenty, thirty or more in your area, not one. The one you have is at Hamilton 7, Hamilton 9 and 10, but you need many more to be installed through that pumping along the river in Hamilton County. Piezometers or monitoring wells are frequently a part of those wellfields. There will be at least one or an old well that's not used any longer and you can set it up to become this monitoring system. The idea of that is to get information about daily precipitation, the depth to water and then the totalized how much flow is happening. You can create explanations with the kind of combined datasets that then can help to explain the response of the aquifer.

How much will all this cost?

For the equipment it's about \$60,000.00 to \$70,000.00 to get the machinery in place, but they maintain it, this is someone else that's out there making sure everything works that's feeding the information and the data feed could go directly into the operations offices of the utilities. This could be utility level information. SCATA could be added to this system, existing monitoring wells can be added to this system. All of the data that is there can be added to this system and include it into this more focused water management tool. The report on the regional availability is being finished now. We built a model of groundwater and surface water flow we can use to look at accessibility to that water by adding a well to the existing system and saying what would a well here do to all of the existing wells. In the end the future of water in this part of the state requires data in order to develop the resource that's there. If it's available and accessible that doesn't mean it can be automatically be used unless people are working together. The concept of this is to create a county scale water management team that would work together on how to operate their system and try different strategies to develop the supplies that are needed that won't hurt or impact others. To address the questions of conflict so that they're not conflict any longer maybe there's an opportunity buried in that conflict for supplying infiltration galleries that are near the existing wellfields. None of those possibilities can you evaluate until you have the information to start considering them. What's needed at this point isn't work being done by a single utility. What's needed is work outside of and larger than the utility. It's the aquifer system itself that needs to be managed. The management process is really only first about data. Can we just understand how it's behaving and can we change just one or two things and maybe we're okay. That may be where we are with this because you have a transmissive aquifer that gets a lot of recharge. Again, without attention it could be and maybe already is in some cases, diminished.

Questions

Ward asked on your slide showing the difference between Hamilton 7 and Hamilton 9, Hamilton 9 happens to be north of 146th Street in the area where all the pits are and Hamilton 7 is south of 146th Street. I wonder if the reason Hamilton 9 has the decrease shown on the graph and Hamilton 7 has the ups and downs and no discernable decrease like in 9. Do you think that's because of the pits themselves and the dewatering operation?

Whittman stated yes, there's some relationship there. I don't know how much one mitigates the other because if we knew that you could come up with a suggested ratio of pits to homes to make it balance. We really don't know, we kind of estimate roughly the effect of pits on water levels, but we don't have any good data to show that. A couple of those pits need to be instrumented in different ways to understand how they recharge the aquifer.

Havard asked did you look at the future mining plans are for the different facilities and what kind of dewatering they would be doing into the future.

Whittman stated we had limited information from the mining community. They provided us with the data we got from IDEM's MPDS discharge, but they were not willing to talk about their future mining plans. I don't care about their stone, how they're moving, crushing and selling stone, the effect of it on water is what I want to know, but they don't think about it that way. From their perspective it's just a thing in the

way and they move it out of the way with a pump. We weren't able to get more granular detail or even any insight into their planning for the future. What they do is completely legal, it's 100% okay, I'm not talking about them in a bad way, but I am saying there are consequences of one upon the other and we weren't able to do more than ask for information and see what we got.

Havard stated the idea of getting together a future monitoring plan that would require additional negotiation with the mines to bring them in. It sounds like they have a pretty significant impact on the aquifer and water management for Hamilton County.

Whittman stated potentially, yes. I wouldn't say right now because I don't think the data are clear enough, but to me it's clear the potential for conflict is obvious. I've worked in this field a long time and I can sort of draw the line between the dots, so I'm connecting dots, but I think it's clear that the mining is having some effect on water levels in the vicinity of the fractures that are connecting the aquifer to their deep operation. The people that work in the many utilities, is it true that you have at least one or two monitoring wells within each of your wellfields or is that not correct?

Havard stated for Citizens most of our wellfields do have at least one monitoring well. How often do you grab the data from it? We do groundwater sampling on a quarterly basis. I'm not sure how frequently we monitor water levels. I'd have to check, but probably quarterly for that as well.

Whittman stated I think a lot of utilities think this sounds great, but it's the commitment that has to be made for the money.

Pappas asked do you see in the future a place for resiliency funding for water utilities to put this type of technology together either to form into networks or to even host a larger data supply back to the state as they continue to make decisions about future water planning as anticipations climb?

Whittman stated I have a really active imagination and I'm an optimist, so yes, I see ways this can be done. What's needed first in areas like this, not everywhere maybe in the state, but in areas like this it would make sense to have a water management fee associated with all high capacity withdrawals. The Kentucky River Authority along the Kentucky River and in Kentucky has a fee of \$200.00 per million gallons withdraw for any purpose. That would hit most people, but it would mostly public water utilities here. That kind of a fee would be enough to pay for all of this in Hamilton County where a fee was charged for water management, the fee goes to a bucket maybe that the IFA has or some other entity in the state for the DNR and that money is used by the county to track changes in aquifer conditions so they can develop smart resilient drought management plans. Something like that could be done, it's done everywhere else. We have to move. If we want people to keep moving here and if we want Indiana to be the engine that it can be in terms of work and growth, these things have to happen because these are all about security and it's now one of the top things that all companies look for is water availability. These kinds of things are really risk reducing for economic development.

Ward stated at one time we talked about the possibility of a grant from the state. Was that the Economic Development?

Whittman stated at the time it was the Finance Authority that we were talking about. I think that they would be impressed if someone were to get together an ask like this. I think it would be hard for them to go through all of these steps and then say "oh, by the way, after you figure out that you want to do something about we're not going to help you, after we pointed to your county and said you need to figure out what to do". It has so many characteristics that IFA would encourage, I just don't know if they have the funds. Economic conditions are really tough to gauge right now.

Kenton C. Ward, CFM
Hamilton County Surveyor

ATTEST: _____
Executive Secretary