EASTERN VIRGINIA GROUNDWATER MANAGEMENT ADVISORY COMMITTEE

MEETING #2 NOTES - FINAL

THURSDAY, NOVEMBER 19, 2015
DEQ PIEDMONT REGIONAL OFFICE – TRAINING ROOM

Meeting Attendees

EASTERN VIRGINIA GROUNDWATER MANAGEMENT ADVISORY COMMITTEE MEMBERS	
James Baker – City of Chesapeake	John O'Dell – VA Well Drillers Association
Shannon Becker – Aqua Virginia	David Paylor – DEQ
Nina Butler – WestRock	Travis Quesenberry – King George County
Tom Frederick – VA Water and Wastewater Authorities Association	Paul Rogers – Farmer – Member of VA Cotton Board
Rhu Harris – Hanover County	Kurt Stephenson – Virginia Tech
Bryan Hill – James City County	Wanda Thornton – Eastern Shore Groundwater Committee
Keith Martin – Chamber of Commerce	Mike Toalson – VA Home Builders Association
Randy McFarland – USGS (Representing George Harlow)	Dennis Treacy – Smithfield Foods
Sandi McNinch – VA Economic Development Partnership	Brett Vassey – Virginia Manufacturers Association
Al Moor – Western Tidewater Water Authority	Ellis Walton – Farm Bureau

NOTE: Advisory Committee Members NOT in attendance: George Harlow – USGS; Chip Jones – Northern Neck Soil & Water Conservation District; Marissa Levine – VDH; Chris Pomeroy – Western Tidewater Water Authority; Nikki Rovner – The Nature Conservancy; Bob Wayland - Citizen

INTERESTED PARTIES ATTENDING MEETING	
Phil Abraham – Vectre Corp.	Craig Maples – City of Chesapeake
John Aulbach – VDH-ODW	Jamie Mitchell - HRSD
Preston Bryant – James City Service Authority	Dave Morris – Newport News Waterworks
Brad Copenhaver – VA Agribusiness Council	Erik Rosenfeldt – Hazen and Sawyer
Robert Crockett – Advantus Strategies	Jeff Scarano – Brown and Caldwell
Jason Early – Consulting Hydrogeologist	Sheryl Stevens - DAA
Christopher Gill – City of Norfolk	Chris Tabor – Hazen and Sawyer
Barrett Hardiman – Luck Companies	Shannon Varner – Troutman Sanders
Ted Henifin - HRSD	Brittany West – Hunton & Williams
David Jurgens –City of Chesapeake	Christine Wolfe - JLARC
Whitney Katchmark – Hampton Roads Planning District Commission	Andrea Wortzel – VMA/Mission H2O

SUPPORT STAFF ATTENDING MEETING	
Elizabeth Andrews - DEQ	Craig Nicol - DEQ
Sharon Baxter - DEQ	Bill Norris - DEQ
Brandon Bull - DEQ	Mark Rubin – VA Center for Consensus Building
Melanie Davenport - DEQ	Jutta Schneider - DEQ
Scott Kudlas - DEQ	

1. **Welcome & Introductions (Mark Rubin – Meeting Facilitator)**

Mark Rubin, Executive Director of the Virginia Center for Consensus Building at VCU, opened the meeting and welcomed everyone to the meeting. He opened the meeting with a saying: "the Mediator occupies the seat of optimism until others are willing to join him".

He asked for introductions of those in attendance and asked for the organization that they represent.

Mark reviewed the agenda and outlined the items that would be covered during the meeting.

2. **Presentation – The Permitting Program (Scott Kudlas):**

Scott Kudlas, Manager of the Water Quantity programs at DEQ, presented an overview of the Virginia Permitting Process and an overview of the Coastal Plain Groundwater Issues to the Advisory Committee. He noted the following:

- **Virginia Ground Water Management Act of 1992, Code of Virginia 62.1-254:** The General Assembly hereby determines and finds that, pursuant to the **Groundwater Act of 1973**, the continued, unrestricted usage of ground water is contributing and will contribute to pollution and shortage of ground water, thereby jeopardizing the public welfare, safety and health. It is the purpose of this Act to recognize and declare that the right to reasonable control of all ground water resources within this Commonwealth belongs to the public and that in order to conserve, protect and beneficially utilize the ground water of this Commonwealth and to ensure the public welfare, safety and health, provision for management and control of ground water resources is essential.
- **Who Needs a Permit?**
    - **ANY** user in a **GROUND WATER MANAGEMENT AREA** whose ground water withdrawals exceed **300,000** gallons in a month (Exclusions include: closed-loop heat pump systems; oil and gas – there is a conditional clause to the oil and gas exclusion that says that if there is a potential to adversely impact groundwater levels or water quality that DEQ can review it under the permit program; a subdivision with either 20 units or 4,000 units on individual wells does not require a permit – even though it has the same impact as someone who uses in excess of 300,000 gallons in a month) – This applies to any one month period in any calendar year.
    - 300,000 gallons equates on the agricultural side to approximately 1" of irrigation applied over 11 acres OR
    - Operation of a well with a 125-gpm yield for 40 hours OR
    - A small residential subdivision on the order of 20 units or less with individual wells
- **Permit – max 10 year term:**
    - Specifies limits on withdrawals
        - Annual
        - Monthly
        - (There is also a provision to coordinate "daily limits" with VDH should that be necessary – the SWCB can assess daily limits in the permits if they feel they are needed.)
        - source aquifer – the permit specifies what aquifer the water can come from

        - location – the permit specifies the location where the withdrawal can occur
    - Includes the Water Conservation & Management Plan – this is required only for new activities; expanded activities; or renewals of permits that are in their 2nd permit term – for the 1st permit term water conservation & management plans are not required as you are entitled to your historic use (10 Years) – after that first 10 years you are treated like everyone else
    - Contains Reporting Requirements
        - Metered withdrawals – all withdrawals have to be metered
        - Other special conditions (ex: water levels, water quality, etc.) – when using models as tools to evaluate impacts – sometimes when you use a model you are aware of places in the model where you have greater uncertainty than you do in other places, when we have situations like that and we know the uncertainty is within the margin of error within that model we will often ask the applicant to install monitoring wells in those areas where we have that uncertainty – but we still go forward and issue the permit. If it is determined during the permit term that in fact they are having a greater impacts than we anticipated then that would be considered in the next renewal of the permit – if the impact is less - then that will also be considered. We do have special conditions that require either water level monitoring or water quality monitoring.
    - Includes the Mitigation Plan – applies to Area of Impact – when we evaluate a withdrawal we evaluate the geographic scope of where the model predicts that withdrawal will draw the aquifer down one foot or more.
        - Permittee has rebuttal assumption of responsibility for negative impacts to existing users within the area – mitigation is required – there is an agreement that is required in the permit that identifies who those users are and identifies the process that the permittee's withdrawal was the cause of a reduction or loss in capacity. Q/A: Have there been any claims? Yes, there have been claims made against negative impacts of withdrawals in a number of areas - the Hampton Roads PDC has been very successful in managing claims in their area. This is a fairly significant issue for some of the larger users.
- **You have to justify that you need the water.**
- **Technical Evaluation Requirements – Impact/Effect on the Aquifer:**
    - Compare hydrogeologic framework within the model with site specific information provided by the applicant
    - Compare water levels that are found – not only the static water levels in the well but also with the levels we see in the model – the models output is also compared with the monitored data
    - Analyze aquifer pump tests
    - Run appropriate regional model
    - Determine Area of Impact (AOI)
    - Evaluate 80% drawdown criteria – trying to keep a certain amount of water pressurized in the system above the top of the aquifer so that it doesn't dewater – you are allowed to use 80% of that "head" – we reserve 20% above the top of the aquifer to avoid dewatering – this is the surface that we evaluate the draw-down by.
    - Assess adverse water quality changes – we evaluate whether or not we have increased the potential for salt water intrusion or whether we have increased the potential to move

poorer quality water from an aquifer into an aquifer with higher water quality. We want to maintain the higher water quality aquifers that we have.
    - There is a fairly significant report that is prepared each time that we do a technical evaluation.
- **Evaluation Criteria (9VAC25-610-110):**
    - No more groundwater than will be applied to the proposed beneficial use
    - Determine the areas of any aquifers that will experience at least one foot of water level declines and the potential for the proposed withdrawal to cause salt water intrusion...
    - Demonstrate that the maximum safe supply of groundwater will be preserved and protected for all other beneficial uses
    - Demonstrate no significant unmitigated impact on existing groundwater users or the groundwater resource
    - Demonstrates that **no other sources of water supply, including reclaimed water, are practicable**
    - Demonstrates that the groundwater withdrawal will originate from the aquifer that contains **the lowest quality water available that will support the proposed beneficial use**
    - Demonstrates that the amount of groundwater withdrawal requested is the **smallest amount of withdrawal necessary** to support the proposed beneficial use and that the amount is representative of the amount necessary to support similar beneficial uses when adequate conservation measures are employed
    - **Implements the water conservation and management plan** as an enforceable condition of the withdrawal permit
    - Demonstrates that the area of impact of the proposed withdrawal will remain on property owned by the applicant or that there are no existing groundwater withdrawers within the area of impact of the proposed withdrawal – if you trip the threshold it goes beyond the property boundaries
    - Shall provide and implement a plan to mitigate all adverse impacts on existing groundwater users
    - Withdrawals will not lower water levels, in any confined aquifer that the withdrawal impacts, below a point that represents 80% of the distance between the land surface and the top of the aquifer
    - Demonstrate that the proposed groundwater withdrawal will not result in salt water intrusion

The following items were further discussed:

- **Monitoring:** This is handled like any other DEQ permitting program. There are requirements to report quarterly on a monthly basis – the reporting period is quarterly but you report on your monthly use. The permit writers track that use to review whether the permittee has stayed within their permit limits. For those permittees that have special conditions, i.e., where we think that there may be a potential for salt water intrusion, they are doing water quality sampling on a periodic basis and submitting that to DEQ – so we can see whether or not there is an issue.

- **Compliance and Enforcement:** The standard enforcement process will have the permittee and staff work through informal actions first and then you move into a more formal process; a consent order or some form of administrative process in order to reach consent. If that doesn't work then there options to move into a more formal process of hearings, court, etc. leading into a maximum civil penalty of $32,500 per day. Most of the actions however, are really built in a way to bring the permittee back into compliance in a reasonable time frame, with enough of a penalty to create a deterrence but small enough to allow the permittee to put the money where they need to in order to return to compliance.
- **Salt water intrusion:** Isn't salt water intrusion very site specific? The closer you are to salt water the greater the potential for salt water intrusion. However, in the mainland part of the coastal plain there are isolated pockets of "old salt water" that aren't necessarily connected all the way laterally to the Bay or the Ocean. Periodically, one of those "pockets" will get pumped into the system. Does DEQ have a record of where those "pockets" are located? It would be very important to have that type of information available. No, that information is not currently available. That level of site-specific information could be very important. On the Eastern Shore we have a pretty well defined capacity to model salt water intrusion and have used that to identify places on the Eastern Shore where there are seasonal fluxes. On the mainland, we don't have that capability in the model as of yet. Those components/capabilities are being developed but one of the challenges that we have is that on the mainland there is not enough data in the right places to fully calibrate a salt water intrusion model over that large of an area. One of the projects that USGS has finished for DEQ is the design of a monitoring network that would not only be able to monitor the movement of salt water within the system but also give us the data necessary to calibrate that tool.
- **Mitigation Plans:** Most of the required mitigation plans are pretty much "boiler plate" documents. They all kind of look the same. The only differences normally relate to processing – the model pretty much serves as the tool for determining the proportional draw-down at any well from each withdrawer.

ACTION ITEM: Staff will provide an example of a mitigation plan to the Advisory Committee members.

- **Concept of Beneficial Use:** How do you account for population growth and future need as it applies to the concept of beneficial use? The ability of a business to expand? DEQ typically allow the permittee to make their own case for what they think their growth is going to be over the time frame that they think is reasonable. However, what we try to do is to look at what is absolutely needed over the permit term (10 years) and then we end up negotiating something extra in the permit for growth. There is really not a one size fits all formula – it is more permittee specific and is handled on a case-by-case basis.

3. **Presentation – Critical Concepts (Scott Kudlas):**

Scott then presented an overview of the Critical Groundwater Level Concepts raised by the Workgroups to the Advisory Committee. He noted the following:

- Can't use GW without declines in water levels – If your goal is to not see water level decline then you can't have any withdrawals. Our job is all about trying to reduce the rates of decline and to try to bring the head up periodically so that as it continues to decline over time that it is still above that critical level. As water is pumped from a particular well the hydrograph declines over time. You can shut off a well or shut off all of the wells and the water level would come back up but at some point it equalizes and starts to decline again. What is critical and what we don't quite understand why is that when it starts to decline again it is usually not at the same rate that it was declining at before but it is still declining. So what we are doing each time we cut people back is buying more time to go to other sources; to inject additional supplies into the system; or to diversify. That is what we are trying to manage. This was a key concept for some of workgroups as we were talking about some of the issues. What we are trying to do is keep the water level up knowing that once we restore the level that it will decline again.
- Equilibrium: According to the calibration runs of the model that we use today, the equilibrium point simulated by the aquifer is actually below the top of the aquifer. So what that means is that the system doesn't come to a steady state, i.e. recharge = withdrawals, until it is dewatering the aquifer in a lot of places. That is the challenge that we are dealing with.
- Withdrawals of the same size have different impacts based on geographic location.
- The further east you go, the more you can withdraw but the more you withdraw the greater impact you have on those using the more western portions of the aquifer.

The following items were further discussed:

- **Injection:** If you inject water into the aquifer what is the effect on the aquifer? The modeling appears to show the capacity of the aquifer to raise the water level in fairly significant amounts over a reasonable period of time. In 10's to 20's years you start to see some fairly significant increases in water level from injection. You have to look at that as a possible way to offset continuing and increasing withdrawals. The only way to flatten out the withdrawal curve (decreasing water levels) is to add something back into the system (injection).
- **Intermittent Use:** Does intermittent use impact the aquifer differently than continuous use? Yes, the aquifer can take pretty significant pumping over short periods of time and it comes back fairly quickly back to the level it started at. If you have a smaller pumping volume that is pumping for many years (long term chronic pumping) the water level continues to go down and doesn't rebound. Intermittent pumping can be on a period of a couple of years. If you pump really hard over a period of a year to two and ½ years and then stop, the aquifer would be back to where it started within 10 years. The aquifer responds over a period of years to average withdrawals.

4. **Key Terms (Scott Kudlas):**

Scott Kudlas identified a number of key terms that had been discussed by the various workgroups. He identified the following key terms and concepts to the group:

- **Sustainability: What do we mean by the term "sustainable"?** The concept was that we wanted to have a system that was sustainable and available for use over a long period of time. So the question was then what period of time were we talking about? What does sustainable really mean? In the context of the regulatory program, sustainable means keeping the water level above that 80% level all of the time. In the past when we have talked in terms of how long a period might be reasonable to think about sustainability, we have thought in terms of 100 years or more. One of the things that this concept raised was what then does "sustainable yield" really mean in a groundwater context? "Sustainable yield" is the rate at which groundwater can be pumped from the aquifer over the long-term without causing unacceptable environmental (aquifer dewatering); economic (not available at all); or social consequences (impacts of poor water quality or salt water). It is hard to quantify what "sustainable yield" is. Groundwater sustainability could also be defined as the achievement of an acceptable tradeoff between groundwater use and the long-term effects of that use. That is what the current 80% drawdown regulatory level attempts to do. It acknowledges that groundwater levels are going to continue to decline, but accepts the fact that if we manage the withdrawals that we can keep the water level above that 80% level. We acknowledge that we won't be able to keep the level above the 80% level in the center of the cone of depression, but are managing to keep the rest of the system above that level.

Discussions included the following:

  - Are we ever going to be able to have a sustainable supply? Isn't growth always going to occur? Growth may always going to occur but the source of water to support that growth doesn't have to rely on groundwater.
  - One concept of sustainability could be "what you take out is no greater than what you take out". But that is a difficult concept for the Potomac Aquifer, because we are taking out a whole lot more than what is going into the system. We actually don't really know the amount that goes in. On an annual basis we don't know how much is going into recharging the system, but we do know that it is considerable less than what we are withdrawing. So if you take out what goes in and we reach that "equilibrium" point and that equilibrium point is below the top of the aquifer is that okay.
  - Sustainability has the concept of perpetuity. With the Potomac Aquifer, if you have a fixed withdrawal and that fixed withdrawal is greater than what is going in then there is going to be a time period within which it is going to go below the aquifer top. Might be 500 years, might be a 1,000 years but it is going to happen sometime.
  - Going below the top of the aquifer results in some permanent loss of storage. The sediments start to collapse and they can't be rehydrated.

- Is sustainability a viable goal?
- It has to be sustainable at some point or another.
- Is the 80% number set in stone? Is it a "rule of thumb"? The 80% figure is set in statute. Is it scientifically based? The 80% figure apparently originally came from Maryland. Maryland uses the same standard. They thought that 20% sounded like a good number. When models were developed and used it turned out that 20% was the margin of error for the original models. It was considered a good rule of thumb because it kept us from dewatering the aquifer.
- The 80% figure is probably arbitrary from a scientific standpoint. The process that we are talking about is the compaction of sediments as the hydrostatic pressure is reduced. That is what the water levels reflect. The water levels in the wells serve as an indicator or surrogate pressure meter for that point at depth at which the well is open. As the water levels decline it is actually reflecting an actual loss in the hydrostatic pressure in the sediments at the location of that well opening. With that decrease in pressure those sediment grains that were previously held apart by the pressure begin to come closer together and compact. That occurs right away. As soon as water levels fall at all you are going to have some compaction take place. The more water levels go down the more compaction occurs. When you reach the top of the aquifer that means that the hydrostatic pressure at that point is equivalent to atmospheric pressure. What that means that all the compaction that can occur in the sediment already has at that point. It's not that compaction occurs at that point because it is already a done deal at that point. It does degrade the capacity of the sediments to hold and transmit water. As water levels go down, from an economic standpoint you have to drill deeper wells. Also, with this compaction, the sediments are taking up less volume and that translates to subsidence of land surface, which is another emerging problem, especially for folks in the Hampton Roads area.
- We need a definition of sustainable – that is a goal – how we get there is a difficult question – there are a lot of subjective factors.
- The 20% figure is better than zero – 50% would be better – any use is going to cause some water level decline and some compaction of the sediments.
- Do we know how much is natural recharge? We have a number that is used to make the model calibrate but we don't know if that is the exact volume.
- From a practical standpoint, all of the water that is being used is coming out of storage. It is kind of free water in a way, because it is coming from those sediment grains coming together – it doesn't require that the water that you are using to be replaced by water from somewhere else – it is essential coming from right there where it is being taken from – from sediment grains compacting. From what we understand about the age of the groundwater in the system and the very slow rates that it is moving, the amount of replacement from leakage and recharge down through the water table – from a practical standpoint it is almost inconsequential compared to the amounts being removed. Instead

of the term groundwater mining, it is actually more accurate to identify it as "release from storage" – that is where the majority if not all of the water is coming from.

- What are we shooting for? How will we know when we arrive at a "sustainable" solution – a sustainable source? We still have to make some assumptions.
- Are we saying that the more that we grow that the more alternative water supplies (surface, desalination, etc.) we must come up with to sustain this 80% figure? Yes, that is probably a fair summation. Where does this alternative water come from? Is this what we need to be focusing on? That is why one of the workgroups is focusing on "alternative supplies". They are looking at what we need to do to maximize the resource – where else can we get water.
- There was a model run that was done that indicated that a 57% reduction in use by some of our current major withdrawers would take the head loss and flattened it out – it didn't make the head loss go to zero – but the time horizon was extended farther out into the future. That effort would flatten out the loss for about 50 years but at that point it would revert back to the 80% level. Is that the result of unregulated withdrawals? That accounted for all withdrawals. A constant rate of use is still going to pull the level down. Growth would make the 50 year time period shorter. These estimates in the simulation are with a constant growth at the current level – with no growth considered.
- Isn't sustainability the amount of water needed above regeneration? Is it as simple as that? Yes. Then the question is how do you figure out what the amount is?
- The right number is a policy question.
- Why should we be searching for the "right" number - that unknown figure? Part of the thing that is troubling is that when we say that if we do this 57% cutback we buy 50 years but that is only without growth and we know that there will be growth, so it really doesn't make any sense to talk about 50 years. Shouldn't the focus change to what can we do and how fast can we do it to make some of these alternatives, knowing that we are going to have growth, knowing that we can't "cold-turkey" stop the withdrawals out of the ground – and some of the things we are talking about we don't control anyway. It doesn't do us any more good to be taking about 100,000 gallons out of one well in a subdivision or 20 wells withdrawing 100,000 gallons in a subdivision – because it is the same amount of water but one is not regulated and one is – shouldn't we be more focused on how we get from here to where we would like to be rather than trying to calculate what the scientific number is that we know we are not going to get to anyway? Yes, the purpose is get to that point so that we all have a good sense of what is it that we are shooting for. There is no point in use debating options that we know aren't realistically possible. We ought to be looking at what is realistically possible and how we can push the envelope to do that as fast as possible.

- **Water Supply Reliability: What do we mean by the term "reliability" as it relates to "water supply"?**

Discussions included the following:

  - Reliability is having a long-term plan and knowing that the supply is there to meet that long-term plan.
  - Knowing where your growth is and knowing how your community is developing and having the quality supply to meet those needs.
  - Reliability is having sufficient available supplies to meet demands and a long-term plan but not necessarily from a single source.
  - Reliability is having an uninterrupted supply and being able to provide uninterrupted service to meet needs.
  - There is not really an industry wide agreed upon definition of reliability. There are a whole lot of definitions of what reliability is. The most common answer in the literature is the ability to provide that uninterrupted service. What seems to be variable is over what time period. Some people will say that the service should never be interrupted, some say a few hours is okay to be interrupted, and some say a day or two is okay – that seems to be the variable.
  - The concept of reliability has to be operationalized to be effective. You need to determine what indicators or metrics are needed to measure reliability and determining what that means both in terms of a day-to-day operational standpoint but also that long-term perspective.
  - With the development of the water supply plans, do we have an idea of what the projected long-term needs are? Yes, the State Water Resources Plan includes a groundwater model run that all of the permitting users; the current estimate of unpermitted users; and the proposed growth on groundwater in the Water Supply Plans. The Water Supply Plans cover a 30 year time-frame. That is likely as good as the long-term needs assessment that was used in the development of the plans. Based on recent decreases in per-capita water consumption, the Water Supply Plans could be looked at as a possible worst-case scenario instead of an absolute.

- **Demand Management: What do we mean by the term "demand management"?** The Alternative Sources of Supply Workgroup has been looking at the concept of demand management. They have had a presentation and some conversation about some of the different water supply plans within the Groundwater Management Area and one of the things that they heard from folks was that outdoor water use overall has been increasing – not all of it is increasing on the public system – some of it is increasing on the individual private well route – it is becoming more and more of a significant component of the overall water use – information was provided from the HRPDC plan (24 localities) that the summer time usage peaks represented about a 50% increase in normal use – this was attributed to landscape irrigation

primarily. Utilities indicated that the "low-hanging" fruit have already been addressed – they have done rate structures and other kinds of things. One of the key-concepts about demand management that was presented was that there are four opportunities to impact the demand side of the curve, these include: 1) regulatory changes or requirements; 2) economic incentives or impediments (rate structures); 3) incentives – buy-back programs; and 4) education. Most of the utility folks who were there could point to at least some efforts on the part of their systems in just about all of these categories.

Discussions included the following:

- Agricultural Irrigation – There are a number of things that are being done to reduce the water usage by agriculture for irrigation.
- Residential Irrigation – The spikes in usage seem to be the result of residential irrigation for landscape maintenance.
- There was some discussion about using rates to try to effect demand management – the difficulty for localities is that it is a revenue stream – if you are going to cut down on the amount of water, you will end up reducing the revenue stream and probably increasing the cost of water to everybody else.

5. Workgroup Reports – Brief Summary (Mark Rubin):

Mark Rubin presented a brief summary of the efforts of the EVGMAC Workgroups. His presentation from the Alternative Sources of Supply Workgroup #1 included the following information:

- Presentation by HRSD – Injection Project – They are seeing groundwater depletion; land subsidence and salt water intrusion. They are realizing that they are using water once – it comes up, it gets cleaned and then gets discharged back into waterways. The concept of their project is to clean the water and then inject it back into the aquifer through injection wells. Their first phase of modeling was very positive. They are now in the next phase of the project. Looking at a long-term possibility about getting more water back into the aquifer. There are plenty of obstacles yet to go – one is that you have to figure out what the effect of taking this water and injecting it back into the aquifer. In another presentation it was demonstrated that the water being injected was not always compatible with the existing groundwater. They are now moving into the modeling phase. If everything goes well they may be putting water into the aquifer within 10 years. They would like to be in full production by the year 2030.
- Presentation by Hanover County – Aquifer recharge – in early phases of looking at the impact of putting water back into the aquifer up by the fall-line. They have current issues with a number of critical cells that are already dewatering at this point.
- The concept and possibility of the injection of surface water into the aquifer was discussed by the workgroups.

- The injection water is treated to drinking water standards. It's not an insignificant treatment process before injection. Lack of available infrastructure prevents the use of this water treated to drinking water standards from being used instead of being injected. You can't get this water to where it is needed – it would be cost prohibitive to do so. Does quality matter? Yes, you have drinking water quality water in the Potomac Aquifer right now, if you start injecting lower quality (non-drinking water quality) water into the aquifer then you end up with non-drinking water quality water in the whole Potomac Aquifer – so you would have to treat it when you pulled it out of the aquifer. California has been doing this for some time. Texas has been looking at the process. Florida does injection as well.
- The quality of the water that you inject into the aquifer becomes very important. It can't be too clean because it creates a chemical demand that can end up leaching stuff out of the aquifer sediments.

ACTION ITEM: Staff will arrange for a presentation on the injection projects/efforts in the state to the Advisory Group at a future meeting.

- Even if the injection efforts are workable and successful, it doesn't replace the need to look at the reductions that we can make now. One of the reasons for this is the growth issue. Where we want to be in terms of water management is that we want to be using the aquifer, as the statute says, for human consumption and where you need the high quality water. To the extent that we can fund other sources to minimize the demand on groundwater that provides for growth and also stretches out the time line. It is not a silver bullet that solves everything but it is a really big piece of the discussions.
- Presentation on Desalination by Poseidon Water – Project in California – Desalination plant in conjunction with an existing power plant to utilize an existing intake structure right on the coast. The group looked at the concept, but we don't have any power plant on the coast – the group did say that they wanted to look at this concept in terms of using brackish water as opposed to sea water. This is still on the table in terms of potential.
- Demand management was another topic that was discussed by the workgroups.
- Presentation by the City of Chesapeake on their ASR Project – Injection of treated surface water into the aquifer. The main source of water is surface water. This project is long-term and is working.
- Were there any discussions regarding the development and use of surface water impoundments (reservoirs) in the workgroup? It is on the list of options to discuss.

Mark's presentation from the Trading Workgroup #2B included the following information:

- Kurt Stephenson provided presentations and led discussions on the trading concept during the workgroup meetings.

- One of the things that Kurt mentioned in his presentations before the Trading Workgroup was some of the important conceptual principles that provide the foundation for a good trading program. He had looked at a number of different programs that exist today around the country and assessed them in terms of what makes a good water management system that includes trading? There were a number of things that he identified – these included: it should be designed to achieve a certain water resource management goal (that needs to be identified up front); that the investments associated with the trading be cost-effective; that there be incentives for water efficiency and reliability; that the system be designed to maximize the value of the resource; the system should be equitable; it should minimize the impacts on 3rd parties; and it should accommodate future economic growth. These are fundamental concepts for a water trading system that would manage water quantity.
- What is "water trading" system? It is a system where you can trade rights of access to water. If you had a permittee who had an excess "right-to-withdraw", he would be able to trade that "excess" with someone who needed that access to water. The key concepts associated with these programs is that you have a resource management goal and on the groundwater side, the goal is associated with a withdrawal "cap" on available rights to withdraw and use that water. That "cap" is sufficient to achieve those goals. You then have to go through the process of defining and allocating that limited number of rights to use the resource and that you have predetermined a system to allow that exchange to happen.
- Transferable water rights: Many of the important principles for having a water right that was transferable are that it be limited in supply (that there is a finite number of them – that the market was closed); that the rights are clearly defined (they are quantified in terms of how do you access it and what the total amount of that right is that you are allowed and what the duration of that right is – how long do you get that right); needs to address the fact that those rights are not unlimited and that they are conditional on the other private/public uses that are part of the system; there needs to be a system to monitor and enforce the rights and the use of that resource; the ownership interests have to have some predictability and security to it in order for it to have value; there have to be rules in place in order to change any terms and conditions and those have to be identified and clear to all the parties in advance and the duration of those rights need to be consistent with the economics (the investment horizon) of the various people who want those rights. The transaction costs have to be as low as possible.
- The concepts of "trading" versus "banking" were discussed by the group.
- It was suggested that it might be useful to hear from someone from the "Nutrient Trading Exchange" on how they handle the "trading" program and concepts and issues that they have with their program.

ACTION ITEM: Staff will make arrangements for Kurt Stephenson to give a summary presentation on the concept of "Trading" and the "Trading Strawman" document to the Advisory Committee at a future meeting.

6. **Break**

7. **Workgroup Reports (Continued) – Brief Summary (Mark Rubin):**

Mark Rubin presented a brief summary of the efforts of the EVGMAC Workgroups. His presentation from the Alternative Management Structures Workgroup #2A included the following information:

- Andrea Wortzel gave a presentation to the workgroup on the current regulatory structure in Virginia.
    - The workgroup looked at the current structure to see if they could identify what was good about it and what was bad about it. The questions raised by the group included: "Is there a need to change what we have now?" If there is a need for change can the current system be tweaked or do we need to have an entirely new system? Can we keep the current structure and overlay it with another that addresses the issues/problems that are in the current structure? The workgroup is working through those questions. The first step was to look at the current structure and identify those issues/concerns with the current structure. The biggest issue that was identified was that the current structure is based on individual permits and there is no encouragement in the system for regional solutions. The system doesn't impede regional solutions, but there is no real encouragement to pursue one either. There is no mechanism at this point to create a regional solution or even regional dialogue. There is no mechanism to manage funding for a regional solution or to even look at economies of scale between various permittees. The current structure does have the capacity and responsibility to identify resources and problems – VDH does not current have that capacity – DEQ currently does. There is a need for close coordination with VDH.
    - One of the issues that came up in all of the workgroups is the large amount of water that is used by unregulated users – that is something that the Advisory Group will need to discuss because it cuts across all of the issues we have discussed so far.
    - The concept of "term of permits" as it relates to investment and infrastructures were discussed.
    - Fairness and equity issues were noted in the workgroup discussions.
    - The concept of incentives for the effective use of water was a topic of discussion.
    - A concern over the availability of sufficient funding for a management structure was noted.
- Scott Kudlas made a presentation to the workgroup on the Interstate Commission on the Potomac River Basin (ICPRB).
- The concept of keeping the science at the state level was discussed by the workgroup. The concept was that might be the most appropriate role for the state – to have, develop and maintain tools for the long term management of the resource. There may be some questions about adequacy of funding to maintain the information that need to be addressed or needed in a regional context.

- It was noted that the concept of "regional cooperation" is important. The General Assembly is focusing on "regional cooperation" in terms of education and economic development, but natural resources would also be a good tie-in for the GA to consider. This would be a good concept to insert into those discussions at the GA level. The discussions at the GA level are related to an effort to create more money to encourage more regional solutions to educational and economic development issues and concepts.

8. Presentation – Western Tidewater Water Authority Legislative Proposal (Al Moor):

Al Moor with the Western Tidewater Water Authority (WTWA) noted that WTWA is a water authority made up of the City of Suffolk and Isle of Wight County. They are also one of the top 14 permit holders for groundwater. He agreed with the concept of "needing time to diversify". He provided information on a legislative proposal that they had developed. His presentation included the following:

- **Groundwater Conservation Incentive Program Incentive**
- **Water Utility Considerations:**
    - Long-term aquifer protection
    - Value from existing infrastructure investments
    - Time to make any required transition
    - Regulatory certainty for planning & investment
    - Access to solutions from EVGMAC Study
- **Incentive Program Concept:**
    - Opt-In/Voluntary Basis
    - DEQ's ~50% Reduction Goal
    - Transition Period for Owners to Reach Goal
    - Certainty Period for Owner's Use of New Permit
    - Long-Term Permit vs. Now 10-Yr Statutory Max
    - DEQ Reopener Authority for Unknowns
- **Key Issue #1: Participation (Line 33, Paragraph B of Legislative Proposal):**
    - **Voluntary Opt-In:**
        - If don't opt-in - status quo (regular permitting process)
    - **Qualifying Threshold:**
        - Accept a 50% reduction or a comparable level of conservation (such as by Study's future solutions)
        - Note: Excludes authorized drought relief/emergency use
    - **Open to All Who Make Qualifying Reduction:**
        - Not just Top 14 Permittees – All Permittees
- **Key Issue #2: Transition Period (Line 45, Paragraph C):**
    - **Time to Fully Reach New Permit Level:**
        - Up to 15 years based on decision criteria
        - Period to be established in each permit

    - **Decision Criteria for Transition Period Length:**
        - Feasibility & Cost of securing an alternative water source
        - Feasibility & Cost of installing infrastructure
        - Existing investment & outstanding debt on existing groundwater related infrastructure
        - Other relevant factors
- **Key Issue #3: Certainty Period (Line 56, Paragraph D):**
    - **Certainty Period:**
        - Uniform 20 years regulatory certainty period
        - Beginning upon completion of the Transition Period
        - This stability enables sound planning and investment
    - **Permit Term (Line 62, Paragraph E):**
        - Including the case-by-case Transition Period, the total permit term would be 20 to 35 years
        - Subject to DEQ Reopener
- **Key Issue #4: Reopener (Line 66, Paragraph F):**
    - **Reopen permit's withdrawal amount, transition period, or regulatory certainty period only if:**
        - In exceptional circumstances as warranted under existing subsection E of 62.1-266
        - If an industrial or commercial facility permittee closes or substantially reduces operations, or
        - If the permittee consents to such reduction
    - **Otherwise, permit would remain in place providing predictability through the 20 to 35 year plan**
- **Key Issue #5: EVGMAC Solutions (Line 85, Paragraph I):**
    - **Permittee May Use Study Solutions that Emerge:**
        - Water reclamation & reuse
        - Groundwater recharge
        - Desalinization
        - Surface water
    - **Permit Timing & Supporting Modifications:**
        - If DEQ issues permit before Study solutions available, may modify permit to restore earlier withdrawal amount
        - EX: Shift to offsetting by groundwater recharge system.

Discussions included the following:

- DEQ has been talking with Chris Pomeroy and Al Moor regarding this proposal. DEQ absolutely understands that there are "certainty" issues involved and there are financing period involved that have to be understood. There is concern about the time frames included in the

proposal. There is "certainty", but part of the "certainty" is not just what does the permit say but also how much groundwater is actually available. The fear is that we are pushing the "certainty" issue too fast. The hope is that we can commit to having a discussion about the issues that have been raised and maybe be ready to recommend something when this report is due which is in 2017. We understand that the issues are real for some folks, but we urge that we don't rush into this and take a little bit of extra time to discuss the issues before we move on with a legislative proposal.

- Would the proposed permit structure be available to all permit holders? Yes, all regular permit holders.
- There was a sense that the desire would be to not consider any new legislation on groundwater permitting until after this study has been completed. But absent some "certainty" on the permits that are going to be open next year, there is going to be a lot of desire for something this session. Is there any way that DEQ can give some level of "certainty" to permit holders that until this thing is done that permits are going to hold steady? Meaning that they are not going to be ratcheted down before these options are explored or available. DEQ is already in discussions with each of the permittees whose permits are open. All of those discussions are productive. We have a track record and we intend for those discussions to make sense for the aquifer but also to make sense for the realities of the permittees themselves. We are pretty optimistic with the discussions that have taken place. We are not seeing that we would be issuing a draft permit to those we have talked to so far. DEQ is in a problem solving mode with the current permittees as we move forward. We would resist a blanket moratorium on the issuance of permits because we have some permittees who are pretty close to knowing where they want to be in terms of the permit and are ready to move ahead.
- On line 68, Item 2 of the proposed legislation, why is it that only industrial and commercial are highlighted for a substantial reduction and not all permittees? Why just those two? These are the largest permittee classes – these are the substantial permits.
- The way the bill is constructed right now indicates that someone could get access to allocations that are not used and achieve that 35 year permit term and spend lots of money to get this allocation but doesn't quite hit the 50 year target gets nothing in terms of that extended permit term. There appears to be a potential inequity as a result of the way the bill is constructed right now.
- Is there anything that prohibits someone from using 100% of their allocation in 15 years and closing their facility and moving out of state? That would be a business decision.
- This does bring up the issue of available infrastructure and how it is tied to permits, which we clearly are going to be dealing with.
- Regardless of what the provisions are in this particular bill, it is a lot easier to make progress if we are not talking about things happening next month or next year, because we all start sitting back and saying and asking "how do I get there?" Whatever mechanism we talk about, the more we can agree on where things ought to be 10 to 15 years or even 20 years from now that gives us a better chance of having a consensus. Then we backup and look at how do we get from here

to there? That then becomes a more productive kind of conversation. From the perspective of a permittee, we are having some very productive conversations with DEQ, but the flip-side of this is that because all of those individual discussions are with each individual jurisdiction and it is difficult for each of the localities to keep up with each other, one of the things that is happening that slows the process down is that there is no perceived uniform way that everyone is being approached. So every jurisdiction is sitting back and saying are we going to get picked on or are we getting as good a deal as another jurisdiction? Are we going to hear from another jurisdiction after we agree to a permit that we look bad compared to the next guy? So the more that we can talk about things globally – not necessarily in this committee – but more globally with DEQ, the more progress we can make collectively.

9. Next Meeting of Advisory Committee:

The group discussed the schedule for the next meeting and possible future meetings. Mark told the group that the workgroups are scheduled to meet one more time between now and the December 14th meeting. A concern was raised that meeting on the 14th seemed to be rather soon. It was suggested that any additional meetings in 2016 not be scheduled until after cross-over or maybe not until after the session.

The group agreed to meet on **Monday, December 14, 2015 from 1:00 to 4:00.**

10. Public Comment:

No public comment was offered.

11. Meeting Adjournment:

Mark Rubin thanked everyone for their attendance and participation in today's meeting.

The meeting was adjourned at 3:45 P.M.