EASTERN VIRGINIA GROUNDWATER MANAGEMENT ADVISORY COMMITTEE

MEETING #4 NOTES - DRAFT

FRIDAY, JUNE 24, 2016

DEQ PIEDMONT REGIONAL OFFICE – TRAINING ROOM

Meeting Attendees

EASTERN VIRGINIA GROUNDWATER MANAGEMENT ADVISORY COMMITTEE MEMBERS	
Tom Frederick – VA Water and Wastewater Authorities Association	Paul Rogers – Production Agriculture - Farmer – Member of VA Cotton Board
George Harlow – USGS	Nikki Rovner – The Nature Conservancy
Rhu Harris – Hanover County	Kurt Stephenson – Virginia Tech
Marissa Levine – VDH	Mike Toalson – VA Home Builders Association
Keith Martin – Chamber of Commerce	Dennis Treacy – Smithfield Foundation/Smithfield Foods, Inc.
David Paylor – DEQ	Ellis Walton – VA Farm Bureau
Chris Pomeroy – Western Tidewater Water Authority	Bob Wayland - Citizen
Travis Quesenberry – King George County	

NOTE: Advisory Committee Members NOT in attendance: James Baker – City of Chesapeake; Nina Butler – WestRock; Bryan Hill – James City County; Chip Jones – Northern Neck Soil & Water Conservation District; Wanda Thornton – Eastern Shore Groundwater Committee (Resigned from Committee); Sandi McNinch – VA Economic Development Partnership; John O'Dell – VA Well Drillers Association; Cliff Parker, IV – Aqua Virginia, Inc.; Brett Vassey – Virginia Manufacturers Association

INTERESTED PARTIES ATTENDING MEETING	
Phil Abraham - VECTRE	Dan Holloway – CH2M
Elizabeth Andrews – William & Mary Law School	Michael Kerns – Sussex Service Authority
Jamie Bitz - JLARC	Allen Knapp - VDH
Preston Bryant – McGuire Woods Consulting/James City Service Authority	Craig Maples – City of Chesapeake
Curtis Consolvo – GeoResources, Inc.	Joe McMann - JLARC
Jeff Corbin – Restoration Systems	Jamie Mitchell - HRSD
Richard Costello – Home Builders Association of Virginia	Doug Powell – James City County
Robert Crockett – Advantus Strategies	Jeff Scarano – Brown and Caldwell
Susan Douglas – VDH/ODW	Gerrod Seifert – Booz-Allen-Hamilton
Judy Dunscomb – The Nature Conservancy	Wilmer Stoneman – VA Farm Bureau
Jason Early – CARDNO	Chris Tabor – Hazen and Sawyer
Marty Farber – VA Legislative Services	Shannon Varner – Troutman Sanders
Katie Frazier – VA Agribusiness Council	Michael Vergakis - JCSA
Christopher Gill – Christian & Barton	Britany West – Hunton & Williams
Jeff Gregson – American Water Well Association	Matt Wells - WestRock
Rhea Hale - WestRock	Andrea Wortzel – Troutman Sanders/Mission H2O
Skip Harper - DHCD	

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

MEETING HANDOUTS:

- Agenda;
- EVGMAC Workgroup #1: Alternative Sources of Supply Matrix – Eastern;
- EVGMAC Workgroup #1: Alternative Sources of Supply Matrix – Central;
- EVGMAC Workgroup #1: Alternative Sources of Supply Matrix – Fall Line;
- EVGMAC Workgroup #2A: Alternative Management Structures – Draft Strawman – Possible Changes to the Groundwater Management Act;
- EVGMAC Workgroup #2A: Alternative Management Structures – Groundwater Resources Forum Strawman;
- EVGMAC Workgroup #2B: Trading/Banking – Groundwater Banking (ASR) Strawman
- Comments on Strawman Documents:
    - Nina Butler – WestRock;
    - Andrea Wortzel – Troutman Sanders LLP/Mission H2O;
    - Gayl Fowler;
    - Jeff Corbin – Restoration Systems;
    - Robert Crockett – Advantus Strategies/City of Chesapeake

1. **Welcome & Introductions (Mark Rubin – Meeting Facilitator/Scott Kudlas – Staff for the Committee)**

Mark Rubin, Executive Director of the Virginia Center for Consensus Building at VCU, opened the meeting and welcomed everyone to the meeting.

He asked for introductions of those in attendance. He briefly explained the "Open Chair" concept for those attendees who were not members of the Advisory Committee to make comments or to address the committee.

Mark reviewed the agenda and outlined the items that would be covered during the meeting. He noted that this was not a decision making day for the group but rather a day for the members of the Advisory Committee to provide guidance to the Workgroups and support staff as to whether we are on the right track or not and what else the workgroups need to be doing.

He also noted that we will also be presenting the names of potential members of two additional workgroups that the committee had agreed to at the beginning of this process so that they can begin

their deliberations. The two new workgroups will be Workgroup #3 – Future Permitting Criteria and Workgroup #4 – Funding Options.

Mark informed the group that one of the benefits of the workgroups' discussions has been that people are really talking together and that there appears to be a more trusting relationship being developed between the regulated community and the regulators.

Scott Kudlas noted that this will be the first opportunity for the committee to see some actual work products out of the workgroups. One of the things that the committee members need to be thinking about as you see this materials and hear about its development and hear from workgroup members about things that they have been wrestling with is trying to answer the question of "How is that going to change as we continue to move through this process?" This is a complex issue with a lot of moving parts so the assumption is that at some point in this process the work of the individual workgroups is going to taper off and the main advisory committee will want to meet more often to make the more difficult decisions and have more detailed conversations about specific items in each of the work products. The plan today is to lay out a tentative path for those discussions and deliberations to take as we move forward as something for this committee to look at.

Scott noted that there will also be a series of "discussion structuring" questions that will be proposed along with each of the work products that have been developed from listening to the kinds of issues that have come up in the individual workgroup discussions. These are topic areas that the workgroups feel they need further clarification and guidance from the advisory committee as we move forward with this effort.

2. **Presentation by JLARC Staff on HJR 623 Status (Jamie Bitz - JLARC):**

Jamie Bitz, the Chief Analyst for JLARC (Project Manager for this project) for the work that they are doing related to HJR 623. Jamie presented an overview of the efforts that are being undertaken to address the requirements of HJR 623. His presentation included the following:

- **Status: Study of Effectiveness of Virginia's Water Resource Planning & Management**
    - **JLARC is the Joint Legislative Audit and Review Commission**
    - **JLARC refers to both:**
        - **Virginia's Legislative Oversight Commission, which comprises 14 members of the Virginia General Assembly (9 House and 5 Senate and include some of the more senior members of the General Assembly) and**
        - **A non-partisan objective staff of about 30 full-time researchers under a staff director – typically the project team is 3 to 5 staff members working under a project leader for 6 months to a year in a specific study/review effort.**
    - **JLARC's primary mission: To provide the Legislators with Objective Non-Partisan Research and Analysis to:**
        - **Help legislators learn about state government performance;**
        - **Help legislators assess state government performance; &**
        - **Help legislators correct unsatisfactory performance/deficiencies**

- **JLARC to study water resource planning and management (HJR 623 – 2015 General Assembly Session) and determine the:**
    - **Sustainability of surface and groundwater resources;**
    - **Effectiveness of state and local water resource planning;**
    - **Effectiveness of water withdrawal permitting;**
    - **Need for strategies to preserve or increase water supply; and**
    - **Adequacy of funding and staffing for Department of Environmental Quality (DEQ)**
- **Under HJR 623 JLARC is seeking to answer the following questions:**
    - **Is the supply of water adequate to meet future demand?**
        - **Groundwater in Eastern Virginia Groundwater Management Area (looking at by how much water withdrawals may have to be reduced from the coastal aquifer to ensure that it can be used in a sustainable way moving forward and over what time frame would those reductions have to be implemented?);**
        - **Surface water statewide (sustainability and what is the potential for surface water short-falls between now and the Year 2040);**
        - **JLARC staff are assessing the:**
            - **Degree of certainty of DEQ findings on sustainability; &**
            - **Strengths and limitations of modeling**
    - **How effectively does state and local water planning ensure adequate water supplies?**
        - **Usefulness of state and local plans to:**
            - **State and local policymakers;**
            - **Public water suppliers;**
            - **Businesses; &**
            - **Economic developers**
        - **Water resource challenges and strategies in state plan (Are there actionable strategies that can be used to meet those challenges?);**
        - **Stakeholder involvement in planning process; &**
        - **Planning in other states**
    - **How effectively do water permits protect water supplies and meet demands?**
        - **Criteria for evaluating applications;**
        - **Length of evaluation process;**
        - **Reasonableness of permit length; &**
        - **Permitting programs in other states**
    - **What are the most cost-effective strategies to preserve or increase water supplies?**
        - **Aquifer storage & recharge;**

        - **Reservoirs;**
        - **Reclamation & reuse;**
        - **Conservation;**
        - **Water trading;**
        - **Regional collaboration; &**
        - **Improved planning & permitting**
    - **JLARC staff collaborating with higher education faculty to look at the state's current water modeling efforts:**
        - **VA Tech Water Resources Research Center facilitating collaboration between JLARC staff and professors with expertise in water resources and modeling;**
        - **Advisory panel has selected faculty (2 – one looking at groundwater modeling and one looking at surface water modeling), is providing advice, and will critique analysis;**
        - **Selected faculty assessing Virginia's water resource modeling**
    - **Survey of public water suppliers, localities, businesses, & economic developers:**
        - **Gather feedback on study issues, including:**
            - **State water resource plan;**
            - **Local plans;**
            - **Groundwater and surface water permitting; &**
            - **Water supply and economic development.**
        - **Survey made available online 2 weeks ago.**
    - **Interviews (A fairly large number of interviews are a part of this study):**
        - **Federal and national experts;**
        - **DEQ staff;**
        - **Public water suppliers;**
        - **Industrial water users;**
        - **Local economic developers; &**
        - **Other states – water management staff – permitting and planning**
    - **Eastern Virginia Groundwater Management Advisory Committee meetings:**
        - **Attending meetings:**
            - **Advisory Committee &**
            - **Workgroups**
        - **Reviewing meeting presentations and minutes**
    - **JLARC Study will be completed in October 2016**
        - **Study findings presented to JLARC on October 11, 2016**
            - **Public meeting**
        - **Full report will be available that morning at: http://jlarc.virginia.gov/**

Discussions regarding the JLARC presentation included the following:

- The difference in the timing of the JLARC report and the report from the EVGMAC was discussed. The EVGMAC has until August of 2017 but the JLARC report has a legislatively mandated reporting date of November 30, 2016. The question was raised as to what is the purpose of this groups efforts if JLARC is going to make their recommendations before this committee has finished its deliberations? How does the EVGMAC report fit into this process? It was noted that JLARC hopes that through their study and report they can do a comprehensive review of water management efforts in Virginia with a specific focus on the Groundwater issues in Eastern Virginia (because that is the most immediate issue to be addressed) and that the JLARC findings and recommendations/options can be used by the Advisory Committee as ideas that can be considered in this forum. This is an independent advisory committee that will be able to evaluate the JLARC study and make its own recommendations. In essence it is hoped that the JLARC efforts and their report will be a resource for the deliberations of this committee prior to development of its final recommendations and report.
- A question was raised as to how recommendations are developed in the JLARC Study process and how the JLARC commission would handle those recommendations. It was noted that it is a fairly extensive process. What the JLARC staff tries to do is to first make sure that they are accurately understanding the program or agency or particular subject of the study and make sure that they are correct in their thinking regarding resources and any identified deficiencies. The most important part is just understanding what is behind any identified deficiency, whether it is a lack of resources or staffing, etc. Trying to identify whether it is a statutory authority issue or lack of enough Code Authority or some other reason. Then they attempt to tailor the recommendation to address that specific cause. They try to make whatever they develop as specific and as concrete as possible, so that it is actionable. So in essence the recommendations are advisory to the Commission. The JLARC Commission will vote to accept or vote to not accept the report that is presented to them by the JLARC staff. They do not vote for or endorse formally any of the recommendations or options of the study/report. It is up to the members of the General Assembly to act on those recommendations or options.
- It was noted that a JLARC Study and recommendations carry a lot of weigh. Is it the intention of the JLARC staff to make specific technical recommendations and legislative recommendations about the Eastern Virginia Groundwater Management Area to members of the General Assembly in October? Do you have specifics in the report as to what JLARC staff thinks should happen based on this study? It was noted that this would be a possibility. JLARC staff will still have to wait until they see how the research plays out but they don't what to close the door on the possibility of specific recommendations being included in the report.
- Does the inclusion of specific recommendations in the JLARC report cause concerns for the Advisory Committee in terms of the work and deliberations of this committee? The concern was noted that this group is right in the middle of its deliberations that are extended and continuing and that has been a lot of work that has gone into this process and there may be some perceived inconsistencies between the two sets of recommendations from the different

groups or there being legislative reaction prior to the Advisory Committee completing its work. It was suggested that in terms of the possibility of any perceived inconsistencies between the JLARC study and the EVGMAC report that there is always that possibility because JLARC is an independent body (an oversight commission). In terms of making recommendations and identifying options for the General Assembly that they may take the ball and run with before the Advisory Committee has made its recommendation – that is something that we are probably going to have to think about as JLARC develops options and recommendation. Generally speaking when JLARC does these types of studies, JLARC tries to first "do no harm". They want to "advance the ball" whenever and wherever possible through this process. It was noted that the JLARC staff would have to think about and consider how their recommendations might impact the work being done by this committee and to try to employ the concept of "do not harm" through that process.

- It was suggested that this group will be able to use the JLARC study and report as information and resources for the deliberations of this group. There will need to be an effort made to make sure that the two efforts are complementary to each other and they don't get in each other's way.
- A lot of people are putting in a lot of work on this effort. (A lot of meetings and a lot of time has been devoted to this process.) The JLARC report is probably going to carry some weight. If this group meets after the JLARC report is released is this Advisory Committee sort of a lame-duck! Are we then meeting for nothing? It was noted that JLARC reports usually present a range of options. So likely what will happen is that there will be a range of options that will be reported by JLARC and then if the Advisory Group determined a preferred option that the members all agree with then that would be the option that the Legislator would pursue. If you read the legislation that authorizes this Advisory Committee, you will find that it is written in a way that clearly indicates that the General Assembly is looking for options, recommendations and solutions from this group. Essentially we have two groups that the General Assembly is relying on to identify those options. There is good work being done in the Advisory Committee and the workgroups so it is not the intention of JLARC to interfere with or disrupt the working of this committee.
- This group represents a lot of the folks that depend on the aquifer and what the people who depend on the aquifer think about how it should be managed is going to matter considerable to the Legislators. Having the JLARC study (the academic exercise) early will serve as a vehicle to inform the users represented in this committee. Maybe if we can arrive at a consensus step forward that is going to carry a lot of weigh.
- A request was made that the JLARC report should acknowledge the existence of this Advisory Committee and the fact that it is right in the middle of its deliberations and that "school is still out" on what is going on in the Groundwater Management Area.
- This is a fairly unique situation where there are two independent groups working on the same issues. JLARC staff noted that what they don't want to do in any review that they do is to impede the existing progress that is already being made.

3. **Review and Discussion of Workgroup Work Products – Alternative Sources of Supply – Workgroup #1 (Judy Dunscomb):**

Judy Dunscomb, a member of Workgroup #1 – Alternative Sources of Supply and the Senior Conservation Scientist for the Nature Conservancy, provided the group with an overview of the Alternative Sources of Supply Matrices that had been compiled by the workgroup for the geographic areas of "Eastern"; "Central"; and "Fall-Line" (copies of the matrices were distributed prior to the meeting and were made available as hand-outs at the meeting). She provided a brief overview of the work of the workgroup in developing the sets of "Alternative Sources of Supply" matrices. Her presentation included the following:

- The three matrices represent three distinct geographic areas within the Eastern Virginia Groundwater Management Area.
- As the overall workgroup was examining a generalized list of alternative sources of supply, it became clear that certain alternative sources of supply would have competitive advantages within some segments of the groundwater region.
- The "Eastern" region which is largely the Hampton Roads area is coastal, most of the water that is available is brackish (salt-water tidal), the surface water that is available is tidally influenced, there are dense populations and the geographically the terrain is generally flat. These factors lends itself to one specific set of solutions as indicated on the matrix for this region.
- The "Central" region is essentially entirely rural, relatively agricultural, relatively dispersed population. The terrain is a little more variable, with some ravines, with some potential opportunities that others have explored previously for surface water impoundments and the surface water is still tidally influenced but much less salty.
- The "Fall-Line" region is proximate to the Piedmont, there is a completely different water supply situation. The terrain is more varied. The groundwater aquifer is more shallow and the surface water supplies tend to be freshwater. This equates essentially to the I-95 Corridor.
- The use of these three separate matrices was seen to be useful as a way to identify alternative sources of supply needed to solve the problem associated with these distinct regions and to be economically feasible given the unique characteristics in each region.
- The work products represented by these three matrices is an interim effort that is still very much a work in progress. The work presented is not finalized and there are still components that need to be further examined and fleshed out. There is not consistency among the three areas so it is not easy to read across from one matrix to another. There is not an explicit prioritization of what the preferences are within each region. To some extent the order of the alternatives kind of reflect that but you can't always use that as a guide. It is inconsistent and not prioritized. Also there are certain issues that have been raised by the group around the regionalization or sharing water or selling water across jurisdictions or how to address wetland issues which have been raised by the group but have not been thoroughly discussed, so there is no consensus view on these alternatives. There are some outstanding issues that still need to be addressed.

- The matrices are structured to include: the source that was considered; there is discussion around funding (local funding and state funding); then is an examination of other impediments and other non-financial incentives. Funding can be a very significant impediment.
- Aquifer Recharge has been discussed both in the context of Eastern Virginia area and in the Fall-Line area. It is a pretty different animal in each of those settings. In the Eastern area, aquifer recharge is probably considered the best alternative that is supported by stake-holders in that region. It is still very much in development as a strategy. There is testing going on around feasibility and costs, but it has a great deal of promise. The time frame over which aquifer recharge at a scale that could be deployed in the Eastern region is probably on the scale of 10 years down the road. This may be a strong contributor to the solution set but it is a ways out. (It was suggested that it might be possible to be able to start aquifer recharge efforts in 10 years but it will take longer than that for that to be expressed in terms of aquifer heads beginning to rise and stabilize except in some localized settings. In terms of saying we have stopped the hydraulic loss except for some localized impacts we are further out than 10 years. Maybe more like 20 years. We could probably get from start of the process to actual injection within that 10 year period but it will be longer than that before you see an impact on the system. There is a significant time lag from injection to seeing actual benefits.) You will not see benefits from this alternative in the short-term. In the Fall-Line area the situation is different – the aquifer is much thinner so there is a greater capacity to influence the potential head within the groundwater aquifer with a relatively smaller effort but similarly the groundwater aquifer is thinner there so the overall supply in that aquifer is less. The ability to really influence the larger region may be less. So aquifer recharge is discussed as an option in both areas but where it sits as a priority in the Fall-Line isn't clear.
- In the Fall-Line region, one of the other alternatives that have been discussed as a viable and available option across the board is water reuse, including non-potable reuse – this appears to be an alternative supply that is much more assessable – it is present now, it could be used now – but there is a recognition that there is a significant "ICK factor" associated with it. A major public education effort as well as some technical efforts and infrastructure development would have to accompany a significant increment of reuse – especially non-potable reuse in domestic settings.
- An issue that has been very interesting to hear discussed within the group is the use of surface water impoundments. The failure of the King William Reservoir project to become permitted and the issue with wetlands has created a perception, a very reasonable perception, that surface water projects/impoundments in this region are just a nonstarter. But what has become clear through the deliberations of the group is that it is hard to see a set of solutions to the groundwater issue that does not include some form of surface water impoundment. There are interests that are very interested in promoting smaller sources. There are interests that want to look at regional solutions. What form that surface water impoundment development takes is yet to be determined. It is clear that some element of the use of surface water impoundments is going to be part of the solution set.

- There are some wetland issues associated with the development of surface water impoundments that will need to be addressed. Some of the comments that were submitted around this concept were talking about wetland impacts and what the state might do to not count wetland impacts as impacts from surface water development. There are some federal/state jurisdiction issues that would need to be addressed when considering what to do about wetland impacts. Some form of regional solutions around how to those kinds of impacts are mitigated for have to be part of this conversation.
- A couple of issues were unique within the Central Region – that area economically has a more diffuse population that comes with some more unique challenges – aquifer recharge is not a significant option in this region – there are a lot of folks on groundwater that are not on municipal water supplies – in this area there is a potential impact on the rate payer with each marginal water supply/source being brought on-line being quite costly – the Central Region really highlights the complexities of financing. It also highlights the concerns that individual localities have about entering into agreements with other localities to buy water. There appears to be a strong disinterest to be dependent upon an outside locality for water and there is a sense that the pricing structures for those agreements may favor those that have water over those that don't. This is an issue that the group is going to have to discuss a little bit more.
- In the Eastern Region there has been more discussion about the use of stormwater – particularly interesting is the consistency with which the use of water for irrigation of lawns and landscaping is identified as a significant component of water use in the region that water providers would like to see reduced. Alternatives on how to do that include using stormwater for irrigation, but there is also a recognition that this would require a significant public education campaign and perhaps the issue there is some sense of not necessarily having the capacity to undertake that full scale education, but having the political will/political capital to pursue a shift in lifestyle habits in this way.
- One of the options that is not looming large in the tables for the regions is "desalination". Desalination is a very appealing technology but it requires some things that are really not in place in the regions. When "desal" takes place there is hyper-salinated brine water that needs to be discharged. That discharge needs to be diluted in order for it not to be a contaminant of what-ever body it is being diluted into, so you need a source of fresh water available. The example that the workgroup heard about was co-located with a power plant that had a fresh water discharge that provided a really easy way of diluting that brine water in a cost effective manner. In the Eastern Region there is nowhere that similar situation exists. The more salt that you have to remove from the water, the harder the job is – so the more costly the process. In some ways the Central Tidal Region would be good for this but there is not really the population to demand that volume of use to justify that expense. So "desal" has not emerged from any of the groups as a priority at this time.

Discussions by the group included the following:

- The matrices should also include a "federal funding" consideration in addition to the identified "state" and "local" funding. It was noted that for the most part there is no federal funding available for water supply development. There are some sources for funding through the Safe Drinking Water Act that VDH oversees but those are fairly limited pots of money.
- There is a lot of information included in the matrices. What are the trends? What options/alternatives was the committee spending a lot of their time on versus just "touching" the concept? The workgroup had a lot of discussions on aquifer recharge; surface water supply; and some emerging issues related to regional coordination.
- The "GoVirginia" effort right now is putting the concept of regionalization at the forefront of thought here in the Commonwealth. This seems to be a good match for this kind of project.
- Related to the consideration of the "ick factor" – increasingly the facts don't matter in debates like this. What plays at the end of the day is always a very difficult thing to wrestle with – the political factors and scientific factors as well as the public perception factors all need to be considered in the debate over alternatives and options.
- There are somethings that we don't necessarily today have the political will or support to do and part of what we need to figure out what conditions can be used to gain or create the public support (the political support) for things such as nonpotable reuse and reducing irrigation of landscaping and lawns as necessary solutions.
- A question was raised as to whether the group has looked at how these things are addressed in other states? For example, in Florida apparently 80% of the water is reclaimed for this type of use. There was a lot of discussion about the "purple pipes" and we did hear from a group in Alabama but that was more along the lines of "trading". It was noted that the group would be hearing about the experiences in other states at a future meeting of the workgroup. One of the concerns that have been raised related to the issue of reuse is the somewhat political challenge of creating new infrastructure through existing developed areas. That has been one of the concerns of the Hampton Roads area as they looked at the expense and challenge of the use of reclaimed water and water reuse. The problem is that there is not any existing infrastructure in place at this time to allow use of this option. Also, the use of reuse water would be a very localized solution.
- Based on the discussions, it appears that desalination is being put to the side – are we confident that we have a full awareness of the available technology and experiences by other countries (Israel) and other states (California) now? Are we confident that we need to put this option to the side right now? The workgroup has duly considered a great deal of information both from the individual experiences of members on the workgroup and from outside experts that were brought in from California to describe what the experience of efforts there was and that the key limiting factor was what to do with the hyper-saline discharge. The workgroup felt that they were technically informed enough to demote this as an option at this time. The presentations that the workgroup heard where related to big plants (the gallons per day are like the whole Norfolk Water System). The cost of such an operation would really go up with smaller

facilities. At this point the use of "desal" is not economically feasible with small plants/facilities. The facilities that the workgroup heard about were also ones that were done in partnership with power plants that provided the necessary "dilution" factor for the hyper-saline discharge. This is currently a very expensive option. Within the context of the workgroups, some of the members representing individual jurisdictions still think about it in terms of being able to fund; finance; and produce a plant to meet their needs – the most cost effective way of dealing with these things would be on a larger regional scale facility – people were challenged trying to figure out how that might work.

- A question was raised as to what activities were included in the concept of "irrigation wells"? The discussions to date have considered "irrigation" to include "landscaping" and "lawns" not "agriculture". It was recommended that if that is the case then it needs to clarify that "agriculture" is not included in this discussion/recommendation. The use of the terms "beneficial" versus "non-beneficial" irrigation was discussed.
- The group discussed that the permitting and creation of a surface water impoundment would probably be on the range of 10 to 20 years which is essentially the same time frame that we would be looking to see any improvement in the hydraulic head of the aquifer (beginning to rehydrate the aquifer). We are looking at long-term solutions there is no "silver-bullet" that can be identified that will resolve the groundwater issues on a short-term basis.
- Do some regulations have to be relaxed to meet the water needs? In terms of an impoundment it would probably depend on the public's perception/expectations of how the rules should be applied. For the King William Reservoir, there was 400 acres of impact and there were 800 acres of mitigation sites so from one perspective the regulations were accommodated but from another perspective 400 acres was way too big to have an impact. Increasingly we are seeing a more diverse population that anything that is being proposed is going to have detractors.
- The Henrico water supply (Cumberland) took about 12 years from idea to completion. About 5 or 6 of those years the project was on-hold because of some negotiations between localities.
- The federal government is looking at impoundments differently than they have in the past. It is becoming more obvious that they are more of a necessity than a luxury.

Mark noted the following questions where this workgroup still has work to do:

Discussion Questions Posed to the Committee related to "Alternative Sources of Supply" included:

- **What is needed to further refine and prioritize alternative supply projects?**
- **What will encourage private investment in such projects?**
- **Should we take another look at impoundments – review wetland impacts, changes in federal regulatory attitudes, costs and timelines for such projects?**
- **Should we take a deeper look at reclaimed water projects?**

Further discussions by the group included the following:

- Regarding prioritization, it would be nice to know what the group's prioritization process includes. Is the ranging based on scientific or economic reasons or something else? We need to be transparent in the prioritization process.
- Does the Advisory Committee have any suggestions as to how the workgroup should prioritize these alternatives/options?
- Based on the materials presented it is obvious that some of the alternatives work or don't work in certain regions based on scientific issues or economic reasons. Need to know the rational for how the alternatives are ultimately prioritized. Is there a political rational for the selection of one alternative over another?
- One of the things that the workgroup has identified in terms of further refinement of the current matrices is that there is some benefit in identifying the time frame involved from "idea" to "availability" of the source that we are looking at and whether that length of time frame makes sense.
- What about the redistribution of existing public water supplies? Most of the existing supplies are already under contract. It appears that there may be some "excess" supplies in some areas that might be available for possible redistribution and use in other areas. This would involve the need for "regionalization" and "interconnections". That concept has been raised in some of the discussions in this workgroup as well as in the "Trading" workgroup. There would need to be a compensation mechanism as well as a fairly extensive distribution system available for this concept to be feasible. This concept needs to be on the table for consideration as a possible alternative/option.
- There is a need for identification of the financial prioritization of the alternatives on both a short-term and long-term basis so that we have that perspective to consider when we evaluate the alternatives/options. A secondary prioritization including the "ick factor" or "public perspective" so that we can see how that is blended. If those factors are all blended before it is brought before the Advisory Committee, there may not be an appreciation of the factors considered in the prioritization. It was suggested that the workgroup should include two orders of prioritization back to the Advisory Committee for the identified alternatives/options.
- It was also suggested that the workgroup should also identify "the risks versus the benefits" of the identified alternatives. The primary risk would be the "risk to the resource".
- This group is convened by DEQ. It seems that our prioritization needs to start with "scientific facts" as a base for discussion and decision making so that we can always say that our work is based in science – quickly followed by economics and then move into other factors. It should be an iterative process.
- In order to do any prioritization there needs to be a connection with a user who is actually interested in the alternative that is being proposed. This has been a helpful exercise as far as it has taken us, but it has been very abstract. When we talk about prioritizing we need to know whose need is being prioritized. What is the connection between the various things on the list

and someone who might actually want to pursue that option? Whether it is a local option or is it better suited on a larger regional scale needs to be identified.

- The economic development components need to be included in the evaluation of any alternatives.
- The importance of staying up with the latest technology was discussed.

4. **BREAK (10:25 – 10:40)**

5. **Continued Discussions:**

Following the break the group discussed the following:

- Clarification of the "irrigation" – It was suggested that the term "irrigation" should not refer to "routine agricultural activities" but should clearly note that it included "landscaping" and "lawn". Need to clarify it now so that it doesn't get a life of its own.
- The use of the terms "beneficial" versus "non-beneficial" irrigation was discussed. It was suggested that these might not be the best terms to use, because even though agriculture irrigation is considered "beneficial" someone irrigating their lawn could also be considered by some to be "beneficial". People spend a lot of money on landscaping so maybe a different term than "beneficial" should be used.
- It was suggested that there was a willingness to have a conversation about this distinction related to the difference between "landscaping and lawn irrigation" and "agricultural irrigation" but there needs to be a consideration that everybody needs to play – everybody needs to play a role in this process, including "agriculture".
- The water needs of those maintaining landscaping and lawns needs to be considered and discussed as well as the needs of those doing agricultural irrigation. There needs to be water available for both types of uses.
- This is a concept of meeting the needs of both types of irrigation needs to be further discussed within the workgroup.

6. **Review and Discussion of Workgroup Work Products – Alternative Management Structures – Workgroup #2A (Andrea Wortzel):**

Andrea Wortzel, an attorney with Troutman Sanders and represents Mission H2O, and a member of Workgroup #2A – Alternative Management Structures provided an overview of the strawman document that had been developed as a work product from the workgroup. She noted that she had coordinated the talking points for this presentation with Whitney Katchmark with the Hampton Roads Planning District Commission. Her presentation included the following:

- The workgroup was charged with looking at alternative management structures and the workgroup has had a number of meetings and a number of interesting discussions about what

would be an ideal management structure, what are the elements are the most important in having a water management framework and there were 5 key themes (the common themes) that came out of those discussions:

  - Additional stakeholder involvement;
  - Recognition of the interrelationship between groundwater; surface water and stormwater – looking at water on a more holistic basis;
  - Looking at the potential for regional solutions;
  - The need for certainty; and
  - The sustainability of the aquifer

- The workgroup reviewed the management structures from a number of other states.
- The workgroup looked at regional commissions in Virginia and in other states.
- The workgroup had a detailed discussion about the current permitting system in Virginia – the conclusion of that discussion seemed to be that the current permitting structure actually works pretty well when there is enough water – it doesn't work as well when there are water shortages. We have a situation where the current permitting system has led to an over allocation of the available resource. So the question is "how do you un-ring that bell"? Is it through the current permitting system or is there another mechanism that can be used? That is where the workgroup is looking for some direction from the Advisory Committee.
- As part of the process of seeing how that might work, the workgroup looked at the development/inclusion of a "voluntary allocation agreement" in state code. That is the strawman that was included as part of the meeting handouts. The purpose of the strawman was that currently in the Virginia Code for the Surface Water Management Act there is a provision that says that during times of shortage those users of the water can enter into voluntary allocation agreements that will control during the periods of shortage. It is really not a trading program but is more like "joint permitting". The group looked at what would happen if they took a similar concept and tried to put it into the Groundwater Management Act. The group had a lot of discussion about this concept and reached a couple of different conclusions:
  - Groundwater and Surface Water operate very differently. With surface water, you might have periods of drought but they tend to be relatively short in duration and so you can go back to the permitting system in the interim. That is really not the way that groundwater works – at least not the way this aquifer is working. We have a long-term situation of over-allocation and even if we make the reductions that have been proposed in the current permitting cycle, we are likely to continue to have over-allocation in the future.
  - Also, we already have the ability to enter into contracts/agreements. In fact a number of water providers have entered into contracts to share the water and there is nothing precluding DEQ at this time from considering joint permits or having applicants coming in together to talk to DEQ about how the permit should work.
- Bottom-Line: Creating this mechanism for a voluntary allocation agreement concept didn't really "advance-the-ball". It really doesn't change anything or give us any better or other tools

to use. It doesn't provide any new incentives and it doesn't change the current relationships that already exist. It doesn't change the current dynamics.

- The workgroup is interested in feed-back from the Advisory Committee but as a workgroup has decided that this alternative management structure approach is not worth pursuing further.
- The workgroup also discussed creating some kind of forum as illustrated below (also provided as a handout at the meeting):

Alternative Management Structures Workgroup: Groundwater Resources Forum

Prepared by Whitney Katchmark, HRPDC for June 24, 2016 GWAC

The Alternative Management Structures Workgroup examined a non-profit in Alabama that provides a forum to discuss watershed issues. The workgroup concluded that a similar forum that would discuss groundwater resources would be valuable for information sharing and establishing relationships between permittees. The information would help permittees anticipate resource scarcity and might minimize future conflicts.

The forum would consist of meetings held 2-4 times per year to share information and get to know the perspectives and challenges of groundwater users in the Eastern Virginia Groundwater Management Area. The anticipated participants include working-level representatives from entities that hold permits, state agencies, and technical experts.

The forum would address the following topics:

- State of groundwater resources: water levels, salinity, subsidence
- Policy options: other state or regional approaches to groundwater management
- Resource management: recently issued or modified permits, economic development issues, emerging concerns from specific sectors (agriculture, industry), cost of water

The forum would require an administrator to set agendas and handle meeting logistics. The administration could be handled by the Department of Environmental Quality (DEQ), planning district commissions (one or several), or an academic institution. Another option would be to create a DEQ grant that allows any entity, such as non-governmental organizations and consultants, to apply to administer the forum. The grant concept is based on the existing Virginia DEQ Watershed Roundtable Support grants, which fund organizations to facilitate broad stakeholder groups focused on nonpoint source pollution reduction and watershed protection.

The workgroup did not endorse a specific administrator for the forum. The workgroup did not develop a recommendation for the level of funding needed to support a forum or discuss sources of funding. The expected value of the forum is to establish relationships and a shared baseline knowledge that will make it is easier to deal with resource scarcity and future conflicts. It is easier to establish relationships in low stress environment prior to crisis. The workgroup anticipates that there will be future groundwater conflicts. The forum would not have authority to resolve conflicts. The existing permitting structure and policies would not be altered.

- The purpose of this forum would be to create more transparency; to enable greater communication; and to foster collaboration among the water users. The idea is that this group would meet semi-annually or quarterly for the purpose of keeping everybody apprised on the status of the aquifer and continuing to engage in the discussions about how the resource should be managed.
- One of the things that was talked about is that this process in and of itself has created more dialogue than there has been historically among the water users and so creating some kind of mechanism for that dialogue to continue so that permitting isn't operating in a vacuum but there is more informed discussions amongst the stakeholders would be valuable.
- So the conclusions with respect to this concept is that having such a forum could help with communications but it is really unclear how this would or could impact permitting or actual decisions on groundwater management. There is an open question about the scope of authority that such a forum would have or whether it would provide input into the permitting and planning process versus serving purely as a function of communication or creating more information sharing. Another thought that was considered is would continuation of the Groundwater Advisory Committee or a committee like this be a forum for doing the same thing? Or serve that purpose? We are looking for feed-back from this committee on this concept.

Questions that still need to be addressed include:

- **How do we encourage regional solutions in light of Virginia's local government structure?**
- **How do we encourage a holistic view of water resource – all sources? DEQ does now during permitting. Are there other mechanisms or bodies to review this?**
- **What mechanism or body can be utilized to provide permanent stakeholder involvement in issues such as model maintenance, broad permitting concerns, planning?**

Continuing discussions included the following:

- There are a number of other issues that the workgroup talked about and that we are wrestling with and are looking for feedback from the Advisory Group on. One of these is the question of whether there is an appetite for considering a significant overhaul of the current system – of how we are managing groundwater. When the General Assembly put together this advisory committee it really was at a time that a lot of folks thought was a crisis period – where some permit reductions had been proposed that seemed very drastic and a lot of the permittees felt like that needed to be more dialogue about how do we get there. The benefit of this group is that there has been more time for those discussions to take place and there have been more options that have been considered. There has been more flexibility displayed on both the permittee side and the DEQ side. That same sense of urgency isn't really there anymore. A lot or permittees feel that they are going to be able to get a permit that they can live with during this permit cycle. So the question is if we can live with it for another 10 years, do we really need to overhaul the system now? That is the question for the Advisory Committee – How drastic a

change do you want the workgroup to look at or is this something that we need to see how it plays out over the next 10 years? The downside of not doing something different now is that there is a question about what that means for economic development. Even if these permits get issued with reductions that everyone can live with the aquifer is still over-allocated at the end of the day. DEQ has said that we are still going to have issues that we are going to need to address. So, could new permits be issued? What happens if we have somebody new move into the area that needs a significant source of water? If we don't do anything to change anything now what tools will we have available to meet that need?

- Should the groundwater management area be focused on how much water we want to have available at a given point in the future as opposed to how do we achieve the proposed reductions? In the permitting process the way we look at it is okay, we have over allocated, we need to get down to this number. How do we achieve that? But should we change the way of thinking to look at "it would be ideal to have this much water available in the future" – how do we get there? Traditionally when we look at the permitting scenario we have an identified need. We know who is going to use that water. But do we need to think about it a little bit differently when we know that we don't have any new water available? What are our water sources going to be in the future and how much is it reasonable for us to have available?
- The workgroup looked at the management of water resources in Georgia. The Governor's Office in Georgia decided to create a fund to identify potential reservoir sites in the future and they set aside money to purchase those sites to preserve them for future water supply projects. Is this something that we might want to look at in Virginia?
- The role of water affordability needs to be considered.
- Reconsidering how water impacts are evaluated and prioritized needs to be part of the process. Should priorities change in the face of a demonstrated need?
- There is an outstanding question about how unpermitted withdrawals should be addressed – the workgroup has not tackled that topic. It is likely that the "future permitting criteria" workgroup will be looking at that issue. This is an open question that does relate to the management structures discussion.
- Should regional large scale solutions be pursued and what incentives or structures can be developed to enable this to occur?
- The workgroup has kicked around the idea of creating some kind of Regional Authority or Management District – that seems like a very significant or dramatic change, so the question again is there an appetite for making that kind of a change?
- There has been a lot of discussions about the role of Water Supply Planning and how that relates to permitting. It is very vague in the state code right now but there have been a lot of discussions about how maybe planning should plan a greater function in the permitting process. The question is "how would that work"? Are the plans and the permits really working together?
- Should we be looking at where we want to be in the future? How much water do we want to have in the future? Or should we be looking at how much do we need to reduce our use of groundwater? How do we reduce our use of groundwater?

- In looking at the water as a holistic resource, could DEQ's structure be changed so that there is greater consideration of the water system as a whole when looking at withdrawals? We have a groundwater permitting program; we have a surface water permitting program; we have a stormwater management program, but should there be greater integration or should there be changes either to the state code or to the regulations to insure a better analysis of the resource as a whole?
- How does the workgroup plan on answering these fairly substantive questions? What is the process for answering the outstanding questions? The primary question to the advisory committee is "What is the appetite for change? Does this group feel like if we get through this permitting cycle then lets continue to let things work the way they have been and we will address things every 10 years or is there an appetite for us to really do a comprehensive overhaul of the current system? Among the workgroup there has been some hesitation to really explore dramatic change given the fact that discussions have been more productive and it seems like we are going to move forward in a way that everyone can live with.
- DEQ is seeing a lot of really hopeful discussions but those have not gotten us to where the models say that the hydraulic head has been stopped and even if they did (we are trying to provide folks have a glide path to get there) we would still lose another 30 feet of head and the economic development question is still unanswered. We are not yet convinced that we are going to be able to meet the overall goal of stabilizing the aquifer within the next ten years. The discussions are really good in a lot of areas but we have not crossed the finish line yet.
- Part of what the workgroup has talked about is that we have the alternative sources of supply workgroup meeting and collaboration taking place on different options and alternatives so if an option is designated and permitted and put in place as a result of these discussions do we need to overhaul the state code or the regulation to make it happen? How far do our changes need to go? Just because permitting and the discussions are largely going well doesn't mean that the problem has gone away.
- There is a need for an enhanced supply to meet future needs and to provide opportunities for economic development.
- Part of what the workgroup has talked about is that the way that the permitting system works right now is that you have to define a "need" – a very clear need. There is a pretty stringent process that the applicant/permittee goes through to explain and justify that need. Do we need to look at ways to reevaluate how "need" is defined given the situation that we are in? It is kind of the question of rather than saying that "this" is the number and how do we get down to it, should "this" be the number and how do we get up to it? Should we look at it in this way?
- We have been given a tremendous opportunity to study this issue with a lot of very bright and incentivized people and it seems like we should take advantage of that opportunity and look at incremental changes but there isn't any harm in considering and fleshing out what a non-incremental or big system change would look like. Then if we think that it has some promise then we can investigate it further. That would also give us, since we are not in a crisis in the next 10 years, the best opportunity to implement something in the long term, because everyone is making

investments on a 20 to 40 year horizon. We should take the opportunity to flesh out available options.

- It is hard to think long-term as to what the right management solution is, until you know what the alternative is. The alternative is likely to shape what the right management structure should be. The hope is that when we find a solution that as much as possible that we can move towards something that is market driven as opposed to a "heavy-handed" type solution/permitting approach. It would be useful to know what the long-term demand for water is in this region if there was no problem to help to define "what is the gap?" That might help how we look at solutions.
- We know that we have a problem now but how serious is the problem going to be in 10 years? This information might help us to focus our discussions. It was noted that the "Fall-Line" region maybe only has 10 years and "Eastern Virginia" maybe has 30 years. The farther west you are the closer you are to permanent damage and loss of storage capacity.
- The workgroup does acknowledge that there is a problem. The question that the workgroup is grappling with "what is wrong with the current system?" if DEQ does have the ultimate authority and will issue permit to protect the aquifer at the end of the day (that is the system that we have now) and if through this process there are alternatives that are identified there is a "glide path" that enables permittees to get through the next 10 years and then there is a solution in place/a project in place that goes through the normal permitting cycle that gives us another time period. Do we really want to overhaul the current permitting process?
- It would be helpful to know if we need to be looking at a major overhaul of the current permitting process.
- Not detecting any major dissatisfaction with the current process.
- We have been talking about alternative sources and possible solutions for the future with the "disconnect" being "Are we talking about an individual user or are we talking about regional solutions that serves everybody?" We do not have the mechanism right now for a "regional approach". We are talking about living within whatever our water supply means are. All of our tools now are geared towards restricting individual users. We do not have a tool that says, "Okay, we want to use what we are using and continue to develop, and we need to bring the "next project" on-line." There is no way to distribute the costs equitably among those who benefit. There is no mechanism for that. If we want the ability to do that and to pick the next low cost project for the benefit of the region, we need a structure to do that. We need to continue to explore the possibility of a regional solution.
- What the workgroup has heard is that the permitting process is not that far off as far as how it works, it may be over-allocating here and under-allocating there. The discussions have gone along the lines of the question of how do we use a holistic approach to manage the water resources of the Commonwealth? We are really struggling with what does the "Eastern Virginia Groundwater Management Area" really mean? Is it a collection of individual smaller plans that compete with one another or is there a mechanism to tie all of those smaller plans together in some informative piece that goes to the regulatory process? From an agricultural perspective there is an interest in Water Management Planning across the board. There needs to be a way to have a larger, over-arching plan

for the Eastern Groundwater Management Area that at least reflects those smaller plans (those smaller plans are included in it), but some way for those smaller plans or those smaller projects to connect to one another, so that we are not necessarily always talking about the individual regions (Fall-Line; Eastern; Central), but we are talking about the overall unit and its overall health.

- It is a lot about planning as opposed to permitting at this point in the process. The "over-arching plan" needs to inform the permitting process.
- We are talking about a common resource. Under the concept of the "tragedy of the commons" that left to their own devices people will always overuse a common resource. The way that you deal with that is that you have an enlightened self-interest, where people have that full awareness of the bigger picture and their activity or role within it. We need a planning process that results in tools and the kind of awareness that enlightens self-interest. In Virginia that works pretty well because we don't like mandates in general, but we need the governmental intervention piece of it in addition, that has to be informed by that bigger picture, holistic view. We need both the governmental intervention component as well as some way of having that bigger picture and the tools necessary so that individuals can see how they fit within it to be able to move this process forward.
- What we need to is to look at a structure that allows for and implements a regional perspective and has a strong piece in terms of the planning. When DEQ looks at a permit it looks at the groundwater resource as a whole over an area.

7. Discussion on Volume (Scott Kudlas):

Scott Kudlas noted that one of the things that the committee members and workgroup members have asked for is "Exactly how much water are we trying to target?" How much water can we pump from the groundwater system without degrading it? How much water can we pump from the system without unacceptable impacts? The noted the following:

- The answer to that question is more complicated then it seems. The reason for that the impacts are driven directly by the location at which they are occurring and depending where they are located changes the amount of water that is potentially available or not available.
- This concept really gets into the question about large scale planning and regionalization. If we want to set a future target for a certain amount of water to be available over time, we also need to take that next step and have an idea of where will these withdrawals be located and that's when you get into the complexity of "who wins and who loses" and can people share the benefits of that common resource because it may not be available in every community.
- For the system that we have now and where the withdrawals are currently occurring what we are looking at is 40 to 50 mgd of permitted and 30 to 40 mgd of unpermitted (withdrawals that are below the regulatory threshold on an individual basis). So what we are looking at currently is a range of 70 to 90 mgd. Our permitted values right now are 114 and our best estimate for unpermitted is 30 to 39. The challenge that we have is we are looking are reducing 30 mgd in permit reductions but on the unpermitted side of the coin we are also seeing in the data that is

available to us an estimate during the current recession or last recession (depending on whether we are still in it or not) of 1 mgd of growth per year. So even if we cut 30 mgd through permit reductions, in 30 years that is gone by the growth in the unpermitted sector. So this is the other factor that we have to balance.

Discussions by the group included the following:

- The "30 to 39" figure is the estimate of current use by "unpermitted users".
- Of the 114 figure about 60 to 70 mgd is actually being used.
- Right now we have 100 to 110 mgd coming out of the aquifer and that ought to be at 70 to 90 mgd.
- Are there specifics on the use of the withdrawals from the unpermitted/unregulated users? What we have is the number of permitted private wells and we have the USGS/DEQ per capita use factors that are statewide averages for those types of homes. But those are not all homes – some of those are irrigation – we have the breakdown in the data about which ones are homes and which ones are irrigation (those are the two categories). A question was raised as to what that breakdown in uses was.

ACTION ITEM: Staff will provide information to the group on the breakdown of the categories of "homes versus irrigation" for the unpermitted/unregulated community.

- The challenge is that it is not as simple as saying "this is" the number or "that is" the number because it depends on where you are.
- What are the areas that are the most vulnerable and that create the most impact? The closer that you get to the "Fall-line" the bigger the impact because of the wedge.
- The numbers/estimates provided are based on the entire groundwater management area, including all of the associated aquifers.
- A reference was made to a 10 year period for the Fall-Line: In terms of loss of permanent storage capacity, it means that we have gotten to the point that we are no longer just extracting water that pops up above the aquifer top but we are taking water that is below the aquifer top which is causing those sediments to collapse and we already have a few locations in the Hanover area where we are below the aquifer top right now. Those sediments could rehydrate but maybe only to 60 to 70 percent of where they are if we "keep them wet". The actual figure will vary depending on the individual sediments but it could amount to a level of 30 to 40 % permanent subsistence.
- This goes back to the notion of whether the system needs to be overhauled or how much of it can you do through the permitting process and how much do you need to do through planning and the use of regional tools to address it.

Mark asked the group whether they had any thoughts about the strawman that had been presented for the work product for Workgroup #2A. Are there any strong feelings about whether we should be pursuing it or not? The committee really did look at the voluntary allocation concept hoping that it

would be a kind of market driven way to deal with the issue. The folks that it was intended to benefit didn't think that it was going to benefit them. No strong feelings about pursuing the voluntary allocation agreement were expressed by the group.

Mark noted that the second part of the presentation that dealt with the concept of creating a Forum was a way to take a regional view and to have more stakeholder involvement and to be able to look at it holistically. The questions that remains are: How would such a Forum interact with the permitting process/program? What form would the organization take? In Alabama, they had a 501(c) (3) organization that got some federal funding and it is made up of the stakeholders and they meet regularly – they don't have any authority but they do talk about these various issues to make advisory recommendations to the regulatory bodies about projects and about the resource as a whole. We have started looking at this concept. The questions are: "Does it have any authority?" "Who's going to be on it?" "Who gets to appoint members?"

8. **Review and Discussion of Workgroup Work Products – Trading – Workgroup #2B (Kurt Stephenson & Shannon Varner):**

Shannon Varner, an attorney at Troutman Sanders along with Kurt Stephenson from Virginia Tech briefed the committee members on the Strawman document that had been developed by the Trading Workgroup. They noted that the big question that the Trading workgroup was trying to address is:

- How can we incentivize putting more water back into the aquifer system when/where needed?

Their presentation included the following:

- A simple of example of trading would be if you had 2 permittees that have a compliance obligation and they need to reduce their consumption of groundwater. One of the permittees can do it much more effectively/efficiently than the other, so those permittees collaborate where one actually creates greater reductions than needed and those excess reductions can then be traded or sold. This creates a balancing type scenario where you are not actually adding anything to the resource.
- What you see in the stream/wetland mitigation banking world is that there are actually people out there are putting in new streams or restoring streams or creating wetlands, we are beginning to see this type of scenario in other parts of the country where people are starting to reintroduce water back into the aquifer. The question then is: "How do we foster that type of activity in Virginia?" Is there an opportunity for trading?
- We see two types of users that might be able to utilize this approach. Those that have the need just for themselves and those that may not have a need but can put more water back into the aquifer to make it available either for themselves or for a broader community. This is the focus of the strawman.
- There are whole lists of other trading scenarios that don't deal with direct injection. There are other ways to benefit the aquifer, for example, surface storage that would be a substitute for somebody's allocation amount and then that groundwater allocation could be tradable for a

certain period of time. Then there is the original concept of water-sharing – similar to the nutrient trading program.

- Why is this important to this group? It is important in any kind of environmental market – you can often times achieve reductions more quickly and do it more efficiently, there can be more innovation into the system and it would bring in private capital to address some of the funding issues. Maybe there is a way that it can reduce the cost of compliance and/or find alternative ways to achieve the needed reductions in use.
- The strawman for Groundwater Banking (ASR) (send out electronically prior to the meeting and available as a handout) was developed by the Workgroup with the two explicit goals in mind. One was to create incentives for people to put water back into the aquifer and to be able to store that water for future use. And two, the workgroup wanted to make sure that DEQ still had the flexibility to manage the groundwater resource when new information became available. These were the workgroup's two overriding goals that they were looking at and they were trying to develop something very concrete to start off.
- There is also some information from other states on how they were structuring their recharge efforts/projects that the workgroup looked at during their deliberations. This material has all been posted to the EVGMAC Webpage under Workgroup #2B.
- The basic proposal from the workgroup is like a banking account/a savings account. You put water into the aquifer, you can save it and then later on when you need it you can withdraw it. The only difference is that instead of drawing interest there might be some slight reduction in your "bank account", because you might "loose" some water from the aquifer. There might be some water losses – which will probably be fairly small. That is the way most aquifer storage projects work, at least when you are trying to store water for the long term.
- It is intended to be function as a long term credit account so that when you put in a million gallons per day it is credited to your groundwater storage account and that you have those million gallon credits that you can draw from. Based on groundwater modeling there might be a water loss that is loss from that storage project every year – that would be estimated for a 10 year period and then would be reevaluated based on new information. There would be a little bit deducted from the account every year to represent this loss to the aquifer. There would be no "sunset clause", so you would have that water, subject to the losses, until you use it/until you draw it back out.
- The workgroup also said that there would be a "recovery zone", so your injection well doesn't have to be at the exact same location as your "recovery well". So they can be in different places within that "recovery zone" which would facilitate/make it easier to move water around the landscape.
- Within the "recovery zone" you could also transfer the "credits".
- The strawman also considers another option that would be like a "checking account". If I put money in, I have to pay my bills in the same year. There are lots of examples of this approach on the East Coast. You might just need "seasonal storage" – something to tide you over the dry spells – so you would inject water during the wet part of the year and withdraw water from the

aquifer during the dry periods in the same year. It is envisioned that there would be an expedited process to allow someone to do this on a "1 to 1" recovery basis over a very short period of time – to smooth seasonal averages. This would be a simpler and faster approach to address needs for those you didn't have an interest in long-term storage.

- Re: Credit Transfers between permittees: Within a specific recovery zone, if you are putting water into the aquifer and adding to your groundwater credit storage account those credits are transferable to somebody that is going to withdraw that water within your same recovery zone. That would be permissible. You can use those credits for yourself or you can transfer those credits to another party. Hopefully this would create an incentive for maybe optimizing or extending the life of a surface water storage project. Because if you have a surface water storage project you could inject that water back into the aquifer from potentially smaller multiple locations and then withdraw it at another location within your recovery zone.

Discussions by the group included the following:

- Re: the Seasonal Approach: Might that concept inadvertently create an incentive whereby the party involved would be compelled to withdraw the amount that was injected (put into the aquifer) just to derive the benefit from it even in the case where it wasn't really needed? For example, you would water a golf course 4 times in a week even though it really only needs to be watered once but you put a million gallons in and you want to get your million gallons back. Has this potential been considered? No, because those million gallons wouldn't be in there unless somebody wanted to go to all the trouble of putting it in. At the end of the process, the system wouldn't see any difference because the approach is "a million gallons in and a million gallons out" within the same period. We did discuss it some in that in the 1st year of a multi-year project there is "no loss" to the system, so a seasonal withdrawal is very similar to the long-term storage area in that you get 100% that first year.
- A mechanical question: How does injection work? When you talk about injecting water into the ground, how does that work for anybody who wants to take advantage of this system? You would still have to require that you get an injection permit. Physically the process involves the injection of water into the aquifer under pressure. It is a conventional well but during times of injection there is a pressure sustaining value to maintain system pressure upstream during times of injection. The water is injected back into the aquifer under pressure. It is expensive because there are water quality requirements that need to be taken into consideration and accounted for prior to injection.

Mark noted that this group started this process by trying to look at a big trading system for the area, but there wasn't a lot of positive feedback regarding that approach so the workgroup narrowed their focus to look at this specific component in terms of how to incentivize putting water back into the aquifer.

Scott noted that it appears that with current modeling tools (being tested right now) that we have available that this is a fairly straight forward exercise in terms of determining what the available credit

will be and how to implement that process through the permitting program.

Further Discussions by the group included the following:

- For any trading program to work you have to have a demand, which obviously we do, and the economics need to work out. "If I am going to be the one that puts the water in the ground then someone has to pay me more than it costs me more than that to withdraw that water. Has there been any ball-park as to whether or not the economics will work out? Because if I am the end-user and have wells in the ground already and I am not investing anything else, I just need to buy water, and if you are the one generating water then you may have to put in new wells, you have to clean the water, there are a lot of costs involved. There is a lot of talk in the general trading world conceptually and it never takes off because the economics don't work out. Have there been any discussions about that – about whether people will pay enough for the water for the economics to work out – to offset the costs involved?
- In general, the costs to the City of Chesapeake to treat what they have injected is minimal because the injection well is adjacent to the Lake Gaskin water treatment plant and when the water is withdrawn, it is treated for manganese removal and then it comes back into tail end of the treatment plant and is blended in with the water that is treated from another source there.
- The City of Chesapeake is an excellent example in the sense that it is a very site-specific. They have a very specific water treatment process, they have a specific water source and the reason why they do that is specific to their circumstance. It might be very different for another user/permittee somewhere else that is facing very high costs and they are looking for an alternative water source and their willingness to pay may be very high. They might be willing to pay higher amounts for water storage and there may be low cost ways to inject that water – there may be gravel pits that don't require a lot of extra treatment. It is a very site specific concept. So the objective of the workgroup was to create a framework/an option that could be used but not to delve down into what are likely to be very site-specific cost factors that will need to be dealt with on a site by site basis/a recovery zone by recovery zone basis.
- A big concern by folks injecting and storing water is how are they going to cover/recover their costs? That is something that the "Funding Workgroup" will also need to consider in their deliberations.
- So a question is "Who gets the free water? And who has buy water?" Because there is no per gallon cost for groundwater extraction right now. The trading system has to contemplate the whole universe. If there are going to be buying of credits then we need to figure out how that fits into the overall scheme.
- In some ways it is a misnomer because at least where the banking concept is right now, it might just be a way for a specific water user to have more flexible options on where they store water or how they manage their water – this gives them more certainty – there doesn't have to be any trading involved at all for this approach to be useful.
- It was suggested that this approach seems to have potential but everything seems to suggest that it is very expensive. Maybe we need to think about the possibility of there being some grant

money or seed money to help offset the costs. Again the big question is "Who is going to be required to pay?"

- Maybe the answer is that everybody pays a little bit. That is part of what the Funding Workgroup has to consider. Do we have a "user's fee"? Do we need some form of broadly based fees?
- This shouldn't be looked at in this type of system as someone getting water for free. It is not the existing water that is already down there, it is water that somebody has taken and put it in there – then the question really is who can take that water? How are you going to repay the person who injected that water?
- This is a pretty narrow option that we have been discussing but again the idea is to incentivize people to put water back into the aquifer.
- We are going to have to define the users – even the unpermitted users.
- There is no question that we have to look at the "unpermitted user" – it has been a topic of discussion in every workgroup. Does the group need to be regulated? Does there need to be a way to capture data on their use?

Mark asked the group whether this was a concept that should be pursued further. The general consensus was that the concept should be further fleshed out. It was suggested that at this time nothing should be taken off the table.

9. New Work Groups (Mark Rubin and Scott Kudlas)

Scott reminded the group that at the first meeting of the Eastern Virginia Groundwater Management Advisory Committee that staff laid out the need for 5 different committees or workgroups that were being considered to provide information to the Advisory Committee to meet their legislative mandate. So far three of those workgroups have been populated (#1 – Alternative Sources of Supply; #2A – Alternative Management Structures; and #2B – Trading). Technically we have populated two of those committees but we made two workgroups out of the original Workgroup #2 (#2A – Alternative Management Structures and #2B – Trading). Given the remaining charges that in the statute, that are to look at future permitting criteria and data needs and to look at where funding might come from for some of these initiatives, we have solicited volunteers and suggested some folks for two new workgroups. These are Workgroup #3 – Options for Future Permitting Criteria and Workgroup #4 – Options for Funding. (A list of names of folks who have agreed to participate on these committees was distributed to the Advisory Committee.) The hope is that we can get your consent to move forward with formation of these workgroups so that we can get initial meetings scheduled.

He asked that if the members of the Advisory Committee had any additional suggestions for members for these workgroups to please let us know. Are there any stakeholders groups not represented that ought to be? The individual members of these groups will be notified and initial meetings scheduled as soon as possible.

Curtis Consolvo from GeoResources volunteered to serve on Workgroup #3 – Options for Future Permitting Criteria. Mark noted that a large part of what this workgroup would be addressing is the issue of "unpermitted users".

Additional requests for membership were received at the end of the meeting and are represented in the lists below:

EVGMAC – WORKGROUP #3 – FUTURE PERMITTING CRITERIA	
Nina Butler - WestRock	Bill Gill – Smithfield Foods, Inc.
Jeff Corbin – Restoration Systems	Chris Harbin – City of Norfolk – Department of Utilities
Larry Dame – New Kent County	Whitney Katchmark – Hampton Roads Planning District Commission
David DePippo – Hunton & Williams	Mike Lawless – Draper Aden Associates
Kyle Duffy – International Paper	Doug Powell – James City County Service Authority
Judy Dunscomb – The Nature Conservancy	Jamie Mitchell – Hampton Roads Sanitation District
Katie Frazier – Virginia Agribusiness Council	Mike Toalson – Home Builders Association of Virginia

EVGMAC – WORKGROUP #3 – FUTURE PERMITTING CRITERIA - STATE AGENCIES	
Lance Gregory - VDH	Rob McClintock – Virginia Economic Development Partnership
Scott Kudlas - DEQ	

EVGMAC – WORKGROUP #4 - FUNDING	
Jay Bernas – Hampton Roads Sanitation District	Jeff Scarano – Brown and Caldwell
Robert Carteris – City of Norfolk – Department of Utilities	Kurt Stephenson – Virginia Tech
Richard Costello – AES Consulting Engineers	Chris Tabor – Hazen and Sawyer
Eric Gregory – King George County	Brett Vassey - VMA
Barrett Hardiman – Luck Stone	Matt Wells - WestRock
Whitney Katchmark – Hampton Roads Planning District Commission	Andrea Wortzel – Troutman Sanders/Mission H2O
Mike Lang – New Kent County	

EVGMAC – WORKGROUP #4 – FUNDING - STATE AGENCIES	
Lance Gregory - VDH	Sandi McNinch – Virginia Economic Development Partnership
Scott Kudlas - DEQ	Steve Pellei – VDH/ODW

10. Next Steps/Timeline (Scott Kudlas):

Scott provided a brief overview of the Timeline for the work of this committee. He suggested the following timeline as next steps for the committee:

- **June – December 2016 – Workgroup Activity Continue and Advisory Committee Consultation/Feedback;**
- **December 2016 – Complete Workgroup Products;**
- **January – March 2017 – Advisory Committee Review (Review of Final Work Products During General Assembly Session);**
- **March – July 2017 – Advisory Committee Competes It's Work – Finalize Report (Dedicated EVGMAC Work Time);**
- **August 2017 – Advisory Committee Report to DEQ;**
- **November 2017 – DEQ Submits Final Report**

Discussions included the following:

- It was suggested that we might want to try to work in something or sometime related to the JLARC report – maybe staff could reserve a room in the General Assembly Building for the Advisory Committee to meet after the JLARC Report is presented to the Commission on October 11th, so that the Advisory Committee can have a conversation on what their report means for the work of the Advisory Committee or if that doesn't work to ask JLARC (Jamie Bitz) to provide a presentation to the Advisory Committee later that same week.

ACTION ITEM: Staff will arrange for an opportunity for the Advisory Committee to meet and discuss the JLARC Report either on October 11th or later that week as suggested.

- It was suggested that some of the members of the Advisory Committee and the staff have significant duties leading up to and during the General Assembly Session and that we should all be mindful and respectful of those commitments.

Scott asked whether this timeline seemed reasonable. Everyone agreed that the proposed timeline was appropriate.

- A question was raised as to whether there was any concept as to the number of face-to-face meetings of the Advisory Group that would be needed and whether there were plans to try to meet again before the end of the year. It is anticipated that the Advisory Committee would need to meet again at least once maybe twice before the end of the year. We will be looking at holding multiple meetings of the group during the dedicated Advisory Committee time from March through July of 2017 and possibly longer duration meetings.

11. **Public Comment: No public comment was offered.**

12. **Meeting Adjournment:** Mark Rubin thanked everyone for their attendance and participation in today's meeting. The meeting was adjourned at 12:00 Noon.