

**EASTERN VIRGINIA GROUNDWATER MANAGEMENT
ADVISORY COMMITTEE**

MEETING #1 NOTES - FINAL

TUESDAY, AUGUST 18, 2015

DEQ PIEDMONT REGIONAL OFFICE – TRAINING ROOM

Meeting Attendees

EASTERN VIRGINIA GROUNDWATER MANAGEMENT ADVISORY COMMITTEE MEMBERS	
James Baker – City of Chesapeake	David Paylor – DEQ
Shannon Becker – Aqua Virginia	Chris Pomeroy – Western Tidewater Water Authority
Nina Butler – WestRock	Travis Quesenberry – King George County
Tom Frederick – VA Water and Wastewater Authorities Association	Paul Rogers – Farmer – Member of VA Cotton Board
George Harlow – USGS	Nikki Rovner – The Nature Conservancy
Rhu Harris – Hanover County	Kurt Stephenson – Virginia Tech
Bryan Hill – James City County	Wanda Thornton – Eastern Shore Groundwater Committee
Chip Jones – Northern Neck Soil & Water Conservation District	Mike Toalson – VA Home Builders Association
Marissa Levine – VDH	Dennis Treacy – Smithfield Foods
Keith Martin – Chamber of Commerce	Brett Vassey – Virginia Manufacturers Association
Sandi McNinch – VA Economic Development Partnership	Ellis Walton – Farm Bureau
John O’Dell – VA Well Drillers Association	Bob Wayland - Citizen

NOTE: Advisory Committee Members NOT in attendance: Chip Jones

NOTE: Also in Attendance: Keith Hodges – VA House of Delegates

INTERESTED PARTIES ATTENDING MEETING	
John Aulbach – VDH	David Jurgens –City of Chesapeake
Jay Bernas – HRSD	Whitney Katchmark – Hampton Roads Planning District Commission
Preston Bryant – James City Service Authority	Mike Lawless – Draper Aden
Jimmy Bundick – VA Water Well Association	Craig Maples – City of Chesapeake
Robert Crockett – Advantus Strategies	Jamie Mitchell - HRSD
Chuck Duvall – Lindl Corporation	David Morris – City of Newport News
Jason Early – Clear Creek Associates	Erik Rosenfeldt – Hazen and Sawyer
David Fluhart –Bundick Well & Pump	Rex Springston – Richmond Times Dispatch
A. Fox – City of Chesapeake	Wilmer Stoneman – Farm Bureau
Katie Frazier – VA Agribusiness Council	Shannon Varner – Troutman Sanders
Christopher Gill – Christian & Barton, LLP	John Voorhees – CARDNO ENTRIX
Daniel Holloway – CH2M Hill	Andrea Wortzel – VMA/Mission H2O
Jennifer Hoover – Augusta County Service Authority	

SUPPORT STAFF ATTENDING MEETING	
Elizabeth Andrews - DEQ	Craig Nicol - DEQ
James Golden - DEQ	Bill Norris - DEQ
Bill Hayden - DEQ	Mark Rubin – VA Center for Consensus Building
Scott Kudlas - DEQ	Jutta Schneider - DEQ

1. Welcome & Introductions (Mark Rubin – Meeting Facilitator/David Paylor – Director of DEQ):

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 and asked for the organization that they represent.

David Paylor, Director of the Department of Environmental Quality, welcomed the committee members and the interested public to the meeting. He told the group that he very much appreciated the willingness of everyone to put the time into this effort. It is a worthwhile effort and that everyone's time is valuable. He thanked the members of the committee for carving out the time from their schedules to participate in this process. He noted the following:

- Almost 10 years ago when he first became DEQ Director, he asked the DEQ Division Directors to identify the top 2 things that had to happen in the next 10 years for the agency to have been successful. Terry Wagner, the Water Division Director at the time told him that we had to learn to manage water differently. We have worked at managing water differently in some ways but in some ways we have been working around the edges. At the time, managing water differently included things such as reuse; aquifer recharge; desalination; certainly conservation – management tools that we can use to make sure that we are getting the right water to the right people in the quantities that they need and do it in a sustainable way.
- Something that triggered this particular effort was our recognition that our aquifer heads are declining and have been for some time. Pre-Industrial era the hydraulic heads were 140 feet above sea level and are now 100 plus feet below that.
- In the groundwater world that situation has triggered this effort to identify ways that we can manage water differently, because as we said during the drought and can still say now that we have plenty of water in Virginia, but we just have to manage it a little more dynamically.
- A goal for this group is that we really begin to make our policy decisions or recommendations about how we can manage water differently so that we can provide all the water that is needed in the quality that it is needed to all the citizens that need it in the Commonwealth.
- We need to determine how we can make sure that everyone has the water that they need.
- At DEQ we try not to be about winners or losers but winners. The goal here is how we can have "win-win" solutions that allow for economic development and to continue to prosper and grow that meets the water needs that all of our citizens, industrial, residential and everyone have. This will take some fresh thinking from those around the table.

- DEQ is simply a member of this committee. There are a lot of folks here that have authorities that DEQ doesn't have and DEQ has some authorities of its own as well. We are looking for a very collaborative effort from all of those involved in this process.
- This process and group is not solely about the aquifer and it is not about permitting of the aquifer. DEQ has a program to deal permitting and we have talked about reductions with existing permit holders. We have had some hopeful and productive discussions with the existing permit holders. The permit holders seem to be stepping up and recognizing the issue and determine what they can do to be part of the solution.
- The overarching concern of this group should be water management at large – how can we manage water differently so that we can supply the water needs of all of our citizens and not be constrained by water.

2. Delegate Keith Hodges – 98th District – Presentation:

Mark Rubin introduced Delegate Keith Hodges who was responsible for the legislation that created this Advisory Committee.

Delegate Hodges thanked everyone for participating in this process and attending today's meeting. He provided the group with some background on how we moved through the legislative process and how we got to where we are today. He noted the following:

- Water is not a headline grabber. We take water for granted. We turn on the faucet and it is there. Water is essential for life. You can't put a price tag on the economic value of water. We can't exist without it.
- Last summer the state of California enacted a law that said to "waste water was a crime". In Nevada, Las Vegas has been paying landowners through a rebate program to rip up their lawns the sum of over \$200 million. This is also included in the deed restrictions so that if the property is sold and the new owner decides to replace/replant the lawn that they have to pay back the rebate plus interest.
- The intent and goal of this process is to prevent anything like that from happening in Virginia.
- We are looking at the Eastern Virginia Groundwater Management area. Any withdrawal of 300,000 gallons or more per month – east of 95 – in this area is granted a permit by DEQ.
- The question that we have to address is how long do we have before we are in a panic mode in this area of the state? Do we have 10 years or maybe 30 to 35 years before we reach that point? We don't really know. We do know that we need to do something and do it quickly. We need to act now before we are in a crisis situation. It takes time to come up with solutions and to implement them. We need to act now.
- We need to figure out how to balance the need for good paying jobs and the use of groundwater in industries such as the paper industry in this area of the Commonwealth.
- Do we let municipalities and localities look at this and address these issues or do we need to look at it from the business community perspective or do we need to look at it from a state

level? Trying to answer this question is how we came up with this legislation. In working through this process it became clear how important access to and availability of water is to local industry and municipalities.

- Serving as a member of the Recurrent Flooding Commission it also became evident that in Eastern Virginia we have problems with recurrent flooding. It has a huge impact on the Middle Peninsula. In working with that commission and looking at a USGS study in 2013, it became evident that the areas with the largest groundwater withdrawals are actually sinking. The ground level is sinking because of groundwater withdrawals.
- A JLARC study was included as part of the Recurrent Flooding Commission recommendations to the General Assembly. JLARC was to conduct a study and to come up with solutions. This was only one of two studies accepted by the General Assembly last year.
- Even though the study got approved it still didn't come up with solutions. So talking with some folks – a special thanks to Katie Frazier with the Virginia Agribusiness Council – we came up with the concept for this committee, the Eastern Virginia Groundwater Management Advisory Committee to look at this and study this.
- This committee is tasked with not only looking at groundwater but the whole water usage and needs picture and coming up with possible solutions. Everything is on the table.
- The JLARC study and the Groundwater Advisory Committee are both ongoing studies. It is important to have both of these studies going at the same time. When the JLARC study is completed, this committee will still be continuing with its work and should be able to use the information generated by the JLARC study.
- 97% of the water on the Earth is salt water; 2% is frozen at either the North or South Pole; leaving only 1% for human consumption. The human body is made up of about 60% water. Without water we cannot live. We need to use that 1% more efficiently.
- David Paylor handpicked each of you as a member of this committee to make these decisions. There are going to be winners and losers but we all realize that we all have to give a little bit to move forward in this process to come up with solutions.

3. Description of Interest Based Problem Solving Process and Introductory Comments (Mark Rubin):

Mark Rubin went through some general meeting and location logistics. Mark discussed the process and the ground rules. He noted the following:

- This is a very fluid process and the agenda will change and be rearranged as needed throughout the process.
- As a facilitator, he does not enter the process as a subject area expert but he does know the lingo used, because the members of the committee are the experts.
- The reason that the Virginia Center for Consensus Building was formed is that the legislative process and regulatory process is not often the best way to solve complex

problems. The issue that causes the most problem in the process is "time and resources". The resources that legislators have to solve these types of problems are pretty limited. The other piece is "time". Nobody can be an expert on everything that is coming through the legislative process.

- The problems that we are looking at in this process, require a lot more time and a lot more expertise than are available in the normal process.
- The idea is to take the folks who are the experts and who are closest to the problem and get them to solve the problem. Then to take that solution to the General Assembly. Then they have the duty to look at the solution that has been presented and determine how to implement it. It is easier for them to work of a consensus solution that solves the problem rather than through a piece of legislation that gets drafted and thrown into the process outside of a consensus process.
- The concept is to take the time and use the expertise that is represented by this group and as Thomas Jefferson said: "When folks get together they can rise above their own interests and work towards the common good." It is a very simple concept. What we are tasked with is solving a problem.
- In most facilitated processes and in most mediations the thing that is most important is the notion of control. The notion that this group has an opportunity to be able to come up with a solution that hopefully then will go through the rest of the process that will result in legislation. What we are going through here is a supplement to the legislative process.
- The notion is that we are going to be able to spend a lot of time up front in a very productive way to come to result that will be legislation that will be brought to the General Assembly.
- This is your opportunity to come to a consensus so that we have a large group of influential people that support a recommended solution that can be taken to the General Assembly for action and implementation.
- You have an opportunity through this process to have some control over the final result and then through the relationships that get built up during this process to get to the point where implementation of the solution results from this process.
- The process that we are going to use is a facilitated process where you as members of the committee are negotiating the solution with the assistance of a neutral mediator/facilitator.
- The two things that a mediator brings to this type of process are: 1) the mediator is typically the only one who can see and believes that there is going to be an agreement that will work – the mediator occupies the seat of optimism until others are willing to join him; and 2) People have a hard time listening to each other – through this process, the facilitator gets to model "good listening" – the notion is that folks start to begin to see a little better about how to listen. What we are doing is creating a space where everybody is going to be heard and everyone will be able to talk and everybody is going to have a real opportunity to listen to each other in this process.
- The statute says that the final decision of what goes into the report is with the Director of DEQ. However, as David Paylor has said, he has every intention of taking what do here and

making that the report. If in the final analysis, something comes up in the end that is new information that impacts the committee recommendations then that will be included and hopefully there will be sufficient time to share that with the group. In the end it is the Director's responsibility to make the final decision.

- Your role is to make recommendations to the Director, who will then issue a report to the Water Commission and others.
- The idea is for there to be workgroups/subcommittees in addition to this main committee. This committee is the "recommenders". The workgroups/subcommittees are going to be providing the "Advisory Committee" with options and recommendations for consideration.

4. Advocacy in the Process (Mark Rubin):

Mark Rubin provided the following thoughts on the concept of "advocacy" in this process:

- Everyone comes to this process with their own set of interests. Everybody knows what they know.
- In this process it is important that we all know what those individual interests are.
- This is probably a different style of negotiating that most of you are used to. The first style of negotiation is adversarial – this is what lawyers do – essential it is a process of the different parties giving up stuff in the negotiation to come to a solution. In the second style of negotiation, which is a collaborative – problem solving style of negotiation – the goal is to meet as many of everybody's interests as possible – the goal is to arrive at a "win-win" situation, where everybody gets something – everybody wins. In order to get to a deal in this style of negotiation, everybody has to win something. You have to make it possible for the other person to agree. There has to be something in it for everybody. We are going to spend a lot of time thinking about the interests that each member of this advisory committee has and how to meet those interests through this process.
- In an adversarial style negotiation – there is "one pie" with a limited number of pieces. In a collaborative style negotiation – the notion is to expand the pie.
- In an adversarial negotiation you don't want to share any information, while in a collaborative negotiation it is important to share information.
- In an adversarial negotiation – the other guy is your opponent.
- In a collaborative negotiation – the starting point is that there is a problem that needs to be solved and we all need to work together to solve it. This was very evident from the interviews that were conducted at the beginning of this process of the various stakeholders interested in this process.
- The concept that needs to be considered is "interest versus position". The interest is "why is it important". We need to think about individual "interests" instead of "positions" in this process.
- What we are looking for is a "wise agreement". A "wise agreement" meets the legitimate interests of each party to the extent possible; resolves conflicting interests fairly; is durable;

and takes into account community interests; it is efficient; understandable; and predictable and it should improve or at least not harm the relationships between the parties.

- It is important that we all leave here not hating each other. The notion is that in these processes is that everyone is at the end of the process invested in the solution.
- "Out of clutter – find simplicity. Out of discord – find harmony. In the middle of discord – lies opportunity."
- Conflict in the public policy arena is inevitable. The only question is how you deal with it. There is no doubt that as we sit here today that there are conflicting interests – the question is how we are going to deal with it. The hope is that we are going to be solving a problem in a collaborative way - sharing information – and being able to come together to arrive at a solution.

5. Ground Rules (Mark Rubin):

Mark reviewed the "Draft Ground Rules" document that had been distributed to the Advisory Committee members prior to the meeting. The following components of the "Ground Rules" were discussed:

MISSION STATEMENT

The Eastern Virginia Groundwater Management Advisory Committee (Committee) will develop a consensus strategy, including legislation for the implementation of the strategy, for the management of groundwater and other alternative sources in the Eastern Virginia Groundwater Management Area (EVGMA). The goal is to create a clear, consistent and understandable framework for the management of the water resource so that local and state regulators, those whose activities are regulated by the law, and consumers, both human and industrial, can guide their actions in accordance with a strategy to sustain the water resource. The intent is to manage the resource so that it is productive and available to meet the human, industrial and environmental needs of the EVGMA.

Every effort will be made to develop a consensus draft strategy and legislation by August 1, 2017, which will be reported to the State Water Commission and the Director of the Department of the Department of Environmental Quality as required by Code of Virginia Section 62.1-256.1.

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- Can everyone buy into the "Mission Statement"? Everyone was willing to accept the "Mission Statement" as presented.

PARTICIPATION

The Committee is comprised of members with the authority to recommend actions within their respective organizations. The membership is representative of industrial and municipal water users, public and private water providers, developers and the economic development community, agricultural, environmental and conservation organizations, state and federal agencies and university faculty. Individuals with experience with groundwater management issues have been selected to participate on the Committee and others will be drawn upon through a work group structure.

- A question was raised over the use of the phrase "with the authority to recommend actions within their respective organizations" and whether that tied the committee members hands in any way. RESPONSE: The notion is that each member of the committee can speak for the organization that they represent. Part of the reason for your selection as a member is that you either have clients or are part of an organization that when you say that "I can agree to that." that you have the authority to do that. It also means that you as a representative of an organization have the responsibility of talking to your organization and keeping them informed on the actions and discussions of the committee.

PARTICIPATION

If a Committee member becomes unavailable or otherwise unable to serve, the Director of the Department of Environmental Quality (DEQ) shall determine whether that member should be replaced. If the decision is to seek a replacement, the Director shall appoint a replacement.

- This statement refers to the situation when a committee member becomes unavailable to participate that the Director, since he selected and appointed the original members of the committee, would be the one to appoint a replacement.

PARTICIPATION

Committee meetings are subject to the requirements of the Virginia Freedom of Information Act will be open to the public and public notice will be provided on the Virginia Regulatory Town Hall website of the date, time and location of Commission meetings. During Committee meetings, one chair will be left open at the negotiating table where a member of the public can sit temporarily to present information or comment on any given topic. Members of the public will be encouraged to communicate their concerns through a member of the Committee who represents their interests but the open chair is available if the member of the public feels it necessary to address the Committee directly to add information that has not been considered. Members of the Committee will not ask members of the public to sit at the table with them during discussions, in order to ensure that representation remains balanced in the Committee.

- This portion of the "Ground Rules" addresses the requirements under the Freedom of Information Act (FOIA). This committee is subject to the Freedom of Information Act. One of the challenges of doing a negotiation under FOIA is that you have to do it in public. That is not how most people negotiate, but that is how we will conduct this committee actions.
- Elizabeth Andrews noted the following:
 - This committee falls under the definition of a "public body" because it is an advisory committee to a state agency.
 - Any meetings of 3 or more members of the committee to discuss the issues before this committee are public meetings – they have to be advertised and open to the public.
 - It gets a little more difficult with "emails". There have been court cases that have looked at the idea that emails between 3 or more members of a public body could constitute a

public meeting. The court has not yet gone to that extent but they did issue a warning that they were looking at the simultaneity of the emails back and forth – there may be a time where due to technology that these may be deemed a public meeting. To be safe we would ask that you don't email each other or to the whole group. If you want to send information or a communication to the whole group that you send it to Bill Norris and he will send it out to the group. That way we can avoid conversations going on between and among 3 members of the committee or more and it gets dangerously close to being a meeting.

- For people who are not on the committee, during the course of any of these proceedings, if you have something that you think is important for the group to hear, then there is an "Open Chair" that you can occupy temporarily so that you can be recognized to make your comment or statement. If there is someone at the table who represents your interests, you are encouraged to speak through them.

DECISION MAKING

The Committee will make every effort to reach unanimity on all issues related to the proposed strategy, meaning that there is no dissent by any member. However, if the facilitator determines that additional discussions are not likely to lead to unanimous consent, the Committee will consider consensus to have been reached when there is no dissent by more than two members.

- The goal of this process is for the decisions and recommendations to be unanimous – it doesn't always work that way but what is suggested is that we would consider that we have reached consensus if no more than 2 members of the committee are dissenting from the recommendation.
- A question was raised as to whether the dissention was tied to the recommendations "as a whole or individual part". RESPONSE: It can be either or to any part of the discussions/recommendations. If a member dissents and writes it down, the dissent will be conveyed as part of the final report, so that we don't lose the point.

DECISION MAKING

During the course of the facilitation, the facilitator may propose a test for consensus on any given issue or on the entire proposal utilizing a 4 level scale to determine gradients of agreement. The scale to be used is as follows:

1. I fully agree and support the proposal.
 2. I can live with the decision. It is okay and I can support it.
 3. I have reservations but will not oppose the proposal.
 4. I think there are major problems with the proposal and am unable to live with it or support it.
More work is needed
 5. If consensus is not present, the Group's discussion continues to determine if the interests of those who could not support the proposal can be met.
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- Sometimes in these processes there are a lot of discussions going on and sometimes there is a feeling that everyone is probably okay with a thought or a concept but there may be a need to take an advisory vote to get a sense of the group and where the discussions are at a given point in the process. The questions that would be posed to determine the pulse of the group are included as items 1 through 5 in this section of the document.

AGREEMENT

If the Committee develops a consensus strategy and draft legislation, the Committee members agree to support the strategy and legislation as it was presented to the Governor and other persons and entities set forth in Code of Virginia Section 62.1-256.1.

In the event that amendments are offered to such legislation during the executive branch review or the legislative process, Committee members agree to reconvene as quickly as possible to review the proposed amendments and submit comments to DEQ and the patron of the legislation for consideration. Committee members may speak as individuals to any such amendments.

If a Committee member dissents from the final consensus strategy and legislation, such Committee member may express the dissent during any future consideration of the strategy and

- If we develop a consensus strategy and draft legislation then the idea is that you will agree to support it in any other places that it would go. David Paylor is committing to take the committee's recommendations with possibly a minor tweak or two, but in general he is going to use the recommendations of the group. The concept is going to be that you agree with those recommendations and will not work against them. You agree to support the recommendations included in the final report.
- A concern was raised regarding the fact that the "introduced bill" is never actually exactly like the bill that ultimately passed in the General Assembly. But names of the participants get floated through the process as being in support of something that may not be what they originally agreed to. RESPONSE: What you are agreeing to support is the legislation and recommendations as it is presented to the Governor. The second paragraph on the "Agreement" section attempts to address the issue of changes and amendments and the reconvening of the group to address any proposed changes.
- A question was raised as to who would change the proposed legislation after it was reported from the committee? RESPONSE: It was noted that changes can occur at any time and at any point in the process. Normally it is just tweaks to the language – not wholesale changes.

GROUP MEETINGS

The facilitator will prepare an agenda for each meeting and distribute it to the Committee prior to each meeting along with any documents that may be proposed for discussion.

OBLIGATIONS OF COMMITTEE MEMBERS

Committee members will communicate their interests and concerns to each other and be

accountable for points of disagreement. They will present proposals and counterproposals which will be designed to address points of disagreement. Members will not block consensus unless they have serious reservations with the approach or solution proposed for consensus.

OBLIGATIONS OF COMMITTEE MEMBERS

Members shall act in good faith and in a respectful manner in all aspects of these discussions whether during meetings or during communications with others, including the media outside of meetings. **They shall also keep the long term interests of the Commonwealth in mind as they participate in the process.** If an article appears in the media that misquotes or inaccurately represents an individual's position, that individual should inform the Committee members of it.

Members will maintain contact with constituencies throughout the process to obtain feedback on proposals and to provide information about tentative agreements reached.

Any member may withdraw from the process at any time by notifying the facilitator in writing.

- While you as a member of this committee have your own interests, the hope is that at the same time you are going to be looking out for the long term interests of the Commonwealth. You essentially sit with two hats on throughout this process.
- It is very important that you maintain contact with your constituencies throughout the process to obtain feedback on proposals and to provide information about any tentative agreements reached. The notion is that folks will keep their organizations and constituencies advised and informed throughout the process.

CONSENSUS: The group agreed to the Eastern Virginia Groundwater Management Advisory Committee "Ground Rules".

6. BREAK

7. DEQ Presentation – Virginia Coastal Plain Groundwater Issues – EVGMA Advisory Committee (Scott Kudlas)

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

- The purpose of the presentation is to try to get all of the committee members more or less on the same page on some of the issues that the committee will be wrestling with throughout this process as well as some of the terms that will be used.
- Geology 101:
 - There are 5 physiographic provinces in Virginia – the one that we will be addressing is the "Coastal Plain".
 - The Coastal Plain Aquifer System in this area is unique in Virginia. The geologic settings are different in the eastern part of the state than they are in the rest of the state. In the eastern part of the state we have an aquifer system where we have basically what we would call a thickening wedge of sediments. It gets fatter as you go further east.

What we have are a series of layers. We have "fine grain sediment" and "coarse grain sediment". The "coarse grain sediment" for all intents and purposes is where the water is and that is the aquifer unit that we withdraw from and the "fine grain sediments" for all intents and purposes are the layers that confine in between those "coarse grain sediments" that create the pressure within the system.

- We have a unique feature, that DEQ and USGS staff discovered, the Chesapeake Bay Impact Crater. That feature does impact the way in which the system works and functions and the way it flows.
- The sediment deposition occurred over a geologic period of time when the ocean was farther inland than it is today or farther east than it is today, past the Eastern Shore. Each time the ocean came over it deposited finer marine sediments and when it receded and rivers came, the rivers deposited fluvial sediments. Those are the ones that make up our most important aquifer and the primary focus of our work, the Potomac Aquifer. This is the most productive and highest quality aquifer that we have in Virginia.
- The VA Coastal Plain Aquifer is a layered system.
- Groundwater Terms and Concepts – well water levels indicate direction of flow:
 - Well water levels indicate the direction of flow – flow is from high water level to low water level – from high pressure to low pressure. It is a very slow moving system that moves at a rate of 100's of years to 1,000's of years.
 - This concept also holds as you go vertically in the system – there are different layers and the flow may go in different directions within the system depending on where the high and low pressure areas are located.
 - When we have pumping we create areas of low pressure.
 - There can also be instances with two different aquifers with a confining unit separating them, where there can be leakage either up or down between the aquifers where there are pressure differences. There are instances of this that occur in the portion of the state south of the James River.
- Cone of Depression:
 - A cone of depression is where the pressure – that water level has been pulled down significantly from where it was at pre-pumping levels. In the case of the coastal plain aquifer in Virginia, the Potomac Aquifer, we have a very large cone of depression that is approximately 300 feet deep that extends for 50 plus miles from West Point to Franklin and from the York James Peninsula all the way to the Fall Line. That's one of the major areas of concern.
- Potentiometric Surface:
 - This is a theoretical surface that if you put a well into an aquifer it is the level to which the water would rise in that well. This provides some important information. Before the Industrial Revolution, around 1900 or so, if you put a well into an aquifer, particularly in the Potomac Aquifer, that water level was artesian (under pressure) and we have information from studies that were done in 1913 and around that time that the level

could be as high as 120 to 140 feet. We have reduced that pressure through pumping so that in some places we are down as low as 300 feet. That is not uniform, but the important thing is overall that has been pulled down below sea level in many places in the Coastal Plain which leads to some other things that become problematic.

- Management Issues: What are we dealing with in the Coastal Plain? We are dealing primarily with declining water levels (drops in pressure); reversal of the hydraulic gradient (groundwater flow) – that is when the water level gets down below sea level (the lowest pressure point – all the water moves toward that area) – which leads to salt water intrusion into the freshwater aquifer; Subsidence and loss of storage. There have been a number of recent studies – the most recent one with USGS – that show that we do have some areas with subsidence and there are some implications that we will need to take into consideration through this process.
 - Groundwater Level Declines – We used to have artesian pressure throughout our aquifer system but we have had a long-term decline in groundwater level over time.
 - Reversal of Hydraulic Gradient – Groundwater Pumping and Reversal of Hydraulic Gradient - Prior to significant pumping in the coastal aquifer system, from the fall line, around Interstate 95, that water flowed, albeit very slowly out to the Chesapeake Bay and the Atlantic Ocean, i.e., from west to east. With the development of significant pumping centers, over time that pumping as it grew started to change that dynamic. The water no longer flowed from west to east to the Bay, but started to flow to these major cones of depression. The situation that we have today is that we have major pumping centers, primarily in the peninsula around West Point and Franklin and the water from both the east and the west and the north and the south are flowing to those cones of depression.
 - Salt Water Intrusion: There are different kinds of salt water intrusion but the one that most people are familiar with is what we call lateral salt water intrusion. That is where we have a pumping center and salt water margins and as we pump the whole thing shifts closer to the well and makes the well salty. That is not as big a concern in Virginia as something called "upcoming". That is when we have a situation where we have the salt water-fresh water interface and we start pumping and we pull saltwater up vertically into the system and we start seeing the concentration of salt water increase. We do have instances of that and that currently is the subject of study right now with a report to be issued sometime this fall. We also have tools that we use – modeling tools – to help us simulate how that water and salinity moves within the aquifer system. We don't have a monitoring well every 25 feet or every 100 feet along the coast line to monitor where this water goes so we have to use simulations to look at some of those issues.
 - Land Subsidence and Loss of Storage: The water pressure was different before groundwater pumping and after groundwater pumping. We had a tool that measured compaction from the late 70's to the early 90's – we had two of these instruments to measure subsidence but they were ultimately lost to budget cuts, but we did measure that for over 20 years. We have documentation of subsidence in several places. The more you pump, the more water comes out of the aquifer, then the aquifer starts to

compact and water that is stored in clays or the finer grain sediments is make-up water to that aquifer and then that compacts and the whole stack compacts. The importance of that is that as it happens we ultimately lose storage within the system – so we lose permanent capacity within the context of that aquifer. This is one of our long term concerns. We understand that some of that is recoverable but the bulk of it is not. As much as 70% is projected to be unrecoverable and 30% recoverable, but there are site specific conditions which may change the amount that is actually recoverable. By in-large we are looking at a permanent loss of storage.

- Measurement of Compaction and Subsidence over-time: There have been measurements in the Franklin area and the Suffolk area that have resulted in the generation of a "compaction map" which represents compaction that occurred in the area from 1940 to 1971. Graphing the data provides a comparison of aquifer declines and compaction of aquifer units as it relates to overall compaction and land subsidence and groundwater pumping at Suffolk and Franklin.
- Groundwater Management in Virginia:
 - We have known about these issues in some form or fashion since the 1950's – this is an issue that the General Assembly has been dealing with for that length of time.
 - Approximately every 20 years the program learns a lot more about how things work; learn about the impacts of different users on the system; learn how the system has responded to those pumping impacts; and as that information became available significant changes in the program occurred. There is a long history of studies that were conducted over the years that were important to policy makers that resulted in changes to the program over time. There is constant-continuing improvement to our understanding of the system so that we manage the system as best as we can.
 - Actual Withdrawals by Aquifer: There have been a number of significant policy changes that have occurred over time that had an impact on the actual withdrawals from the aquifers:
 - § We started to see post World War II very significant increases in groundwater withdrawals in the coastal plain. Post-War Boom; post-war residential boom; post-war industrial boom continued on through the 1970's. By the 1950's – 1955-1956 - it became apparent that those artesian characteristics of the system were being lost. So the General Assembly said that "we need to deal with that". They put in place a law that said that when you are not using your well or when you abandon your well, you have to have a valve on it so that we don't continue to lose pressure in the system from that particular well. That represented the understanding at the time. That was the Virginia Well Capping Law.
 - § As growth continued – as groundwater withdrawals continued almost experientially for the next decade and a half, the General Assembly said that we needed to figure out what is going on - we need to put in place a certificate program and this program will quantify what the rights are of individual users and we will issue you a certificate for those rights to continue to use those

amounts. Those certificate amounts were based on the capacity of the system and the yield of the well. Ultimately that resulted in a significant over allocation of the amount of water that could be withdrawn.

- § By the mid-1980's, that over allocation became apparent and changes started to be made. Initially this only applied to Industrial Users.
- § By 1989 this applied to Municipal and Industrial Users and it also expanded the management area.
- § The management area kept incrementally growing through the years through various actions of the General Assembly.
- § In 1992, it was clear that we had over allocated the system and we had our first modeling tools to evaluate those things and when we took all of those certificates of right that had been issued and we put them into the model, it dewatered the entire system. So the General Assembly took it up again and they said, okay we are going to implement a permitting program now. You can keep your rights for 10 years, but after 10 years, you have to evaluate your use based on 1) your future need but it can't be any more than you can put to use during the permit term and 2) your impact on the aquifer. That's what was put in place in 1992.
- § That program had some impact. We have been able to reduce withdrawals over time. We have seen some improvement in head. The reduction in withdrawals shown on the presentation slide (Actual Withdrawals by Aquifer) represents the shut-down at Franklin.
- § Then we expanded the Management Area and made some tweaks to the program in 2014.
- § As use grew the General Assembly modified its approach to how to manage the resource and that's where we are currently with the program.
- If you look at the hydrographs anywhere in the system today, it doesn't matter where you look in the Groundwater Management Area; there is a long-term record of decline. Largely based on the shut-down at Franklin we have seen some leveling off in Charles City County. We have seen some leveling off in the James City/Williamsburg area. In Suffolk we have seen an initial increase followed by a leveling off and it may drop back down. The message is yes, we have had some short-term recovery but we shouldn't assume that it will be a permanent recovery as long as we plan on continuing to withdraw water from the aquifer.
- A question was raised regarding recharge. RESPONSE: Recharge occurs primarily along the fall-line, but it also occurs vertically throughout the entire system. The important thing to understand about recharge is that the recharge is really-really slow and it occurs at a much slower rate than the rate at which we are withdrawing water. It is this time-lag that creates the problem. It has been said that for every 44 inches of rain (which is the average annual rainfall in Virginia) that about 1 inch or a tenth of an inch makes it to the Potomac Aquifer. If you are thinking about 100 million gallons per day coming out of the aquifer and about a tenth of an inch coming in every year – it doesn't

balance out. There are combinations of withdrawal reductions or other changes to the water balance which could result in introducing more water into the system.

- GW Management Areas – The current Groundwater Management Area has grown from its original boundaries in 1970 to covering the entire coastal plain today. These changes to the management area were made as the impacts to the system could be quantified and identified, because those are the findings that need to be made before the Board can expand the area. We also have a separate Groundwater Management Area that covers the Eastern Shore of Virginia.
- Concerns – We had always seen the declining heads in the Coastal Plain. We knew that those heads were in many instances getting close to the top of the aquifers. But in 2009, we developed a new generation model – this model is state of the art – that reflects the benefits of all of those studies that have been conducted over the years. This model tells us that we have a number of areas that if people use the amount that they are currently permitted; not what they are actually using, but the amount they are actually authorized under their permit to use – that what we would expect to see areas with withdrawals that would result in heads that would fall below our regulatory standard. So there would be significant areas in the York James Peninsula and along the fall-line and up in the King George and Caroline area and Richmond County where we would be unable to issue additional permits, because we are not allowed to pull that water level down further than what it would be with everybody at their total amount. There are also areas that the model indicates that if everyone used their "permitted" amount that the water level would be pulled down below the top of the aquifer and we would begin to see a dewatering of the aquifer and the compaction and loss of storage that we are concerned about. We have come up with some permitting options that could result in the elimination of many of these areas of concern, but that is a topic for discussion at another day.
- The Potomac Aquifer is used by 90% of the users. It is a very large, multi-county area that the model shows would be below the critical surface and/or below the aquifer top – below regulatory standards – with significant areas below the fall-line. Most people can agree that we don't want to be there – there are different ways to avoid getting there, but most people can agree that we don't want to be there. That is why this committee was formed and why you are here today.
- **QUESTION:** On the Eastern Shore, the deep aquifer – the water we are drinking today is about 1,000 years old. How old is the water that we are talking about in the Potomac Aquifer? That people are actually consuming? **RESPONSE:** 100s of thousands years old. Some of the water has actually been age-dated by USGS. There is water down around Franklin that is 40 thousand years old – which is due to the fact that the aquifer is fairly permeable. Up in Maryland, the same aquifer, where you have more confinement, you have water that is a million years old. The water is very-very old. You don't have to get very far from the fall-zone to have a thousand year old water. The recharge is very slow – we are mining that very old water.
- **QUESTION:** RE: Data: Are there existing data gaps or are we confident that given what we just went over that those are the levels that we are dealing with and that the current data is accurate? **RESPONSE:** We are very confident in the areas that show up as problematic in the

model – the reason for that is that we have a very dense network of monitoring wells in those areas – the way in which our tools work is the denser the monitoring network that you have the more accurate the calibration and the more accurate the simulation – it is when you get into the Middle Peninsula and the Northern Neck and the King George area where we have very-very low resolution – we may have, compared to 175 wells in the York-James Peninsula/Hampton Roads area, 10 or 15 wells in those two areas. The further you get away from the populated areas, the more error is likely in the simulation.

- **QUESTION:** Is there a time estimate with the current continued rate of use where we would deplete down to the modeled critical levels? **RESPONSE:** The model is based on a 50 year simulation. The challenge to answering this question is that it really depends on a lot of different things: How does per-capita use change? – How does growth occur? – How much is that growth? This is an order of magnitude number to think about. In certain areas identified in the model there are already issues. There are areas where the model is currently under predicting the impacts based on new wells that have been installed and new information has been collected. Along the fall-line that are areas that within a decade could run into issues. There are currently areas where problems are being to occur. There are areas where within a localities comprehensive planning period (25-30 years) where problems are likely to occur. The problems may first be seen not at the major water supply wells but at the homeowner level – those folks who are using the more shallow parts of the upper part of the Potomac Aquifer. Farther into the Hampton Roads area where you have the really deep sediments, in the really deep wedge, not even at 50 years probably will problems be evident. The challenge is that pumping in one area will reduce water levels in a different area.
- **QUESTION:** The areas that you are indicating are areas where water is very low or deficient. **RESPONSE:** They will be very low if everyone who has a permit today exercises the full amount of their permit. **QUESTION:** It looks like, according to the map that you are talking about the areas of Sussex; South Hampton; part of Surry County. It is basically very rural – other than when Union Camp was there. There is not a lot of tremendous industry located in the area. As you go east it becomes more industrial and more populated. Why is that area more deficient than elsewhere? It was mentioned that on the Eastern Shore they have found that the permits issued to agricultural users were always for more than the actual water usage – because it is just a projection – it is not an issue of over pumping but one of over estimating the water needs. On a site specific basis this could be a concern. **RESPONSE:** There are a couple of things that might answer this question. The system responses usually slower to pumping, but if you have continuous pumping over a long period of time, even when you stop the pumping you will continue to see the decline over-time. Some of the issue that we are dealing with is the legacy from the Franklin Mill. The other part of it is that there is a unique feature in the bedrock in this area, called the "Norfolk Arch", which is bulge or bump in the bedrock that makes the rest of the aquifer thinner there. That is why the dewatering is projected to occur there first, because there is not as much water.

- **QUESTION:** Is the Virginia Department of Health doing the same exercise as they are able to permit wells? Are they going to be included? **RESPONSE:** VDH is represented and has a member on the committee. We recognize the importance of the relationship between the DEQ and VDH programs and the need for continued close coordination between the agencies and various program staff because of the different mandates that we have.
- **QUESTION:** RE – Subsidence – What were the units of subsidence used? **RESPONSE:** The unit is .15 meters. Since 1940 we have lost approximately 1 foot of elevation. We have seen more land subsidence in the West Point area.

8. Work Group and Interaction with Committee (Scott Kudlas):

Scott started a discussion of the work group/subcommittee structure with the group with the following:

- Mark Rubin is inclined to refer to the subgroups that we are considering as "work groups"; Scott calls them "subcommittees". Do the members of the committee have any preference? No preference was noted.
- A handout was distributed that provided information to the committee on subcommittees that are going to be proposed largely based on the issues identified in the legislation that this group is charged with looking at. It doesn't include all of them at this time, partly because of some issues that will be discussed later; sequencing and other things that may have to wait until later in the discussions to address.
- The idea is to start the process with a total of 5 subcommittees – depending on the nature of the work and what the group may want to look at, additional subcommittees could be added. These 5 seemed to be a reasonable subset of topic areas to begin with.
 - The first subcommittee would be "Alternative Sources of Supply", and the second subcommittee would be "Alternative Management Structures". The reason for the proposed two initial subcommittees is that it seems that many of the other issues that the group is tasked with all flow from the identification of either alternative or new sources of supply and alternative ways of managing the system. It seems appropriate, at least for the remainder of 2015 to focus on those two primary committees and depending on their progress those other committees can support those two committees and their work.
- For each of the proposed subcommittees, the issues that are listed in the statute that they are supposed to look at, as well as a couple of other things that followed logically. The proposed sub-committee and their assigned tasks are listed below:

Potential Sub-Committee #1 Options for Alternative Sources of Supply (15)

- Identify options, including, but not limited to water reclamation and reuse, groundwater recharge, desalination, surface water options, construction of storage reservoirs
- Evaluate how such structures might help with future growth and development, future individual reductions and regional water solutions

- For each option, evaluate technical feasibility, data needs, cost, potential location, participants/users, environmental benefits and impacts
 - Other tasks identified by the full Committee
-

Potential Sub-Committee #2 Options for Alternative Management Structures (15)

- Identify options, including, but not limited to water resource trading program, formation of a long-term groundwater management committee, formation of a commission
 - Evaluate how such structures might help with future growth and development, future individual reductions and regional water solutions
 - For each option, evaluate feasibility, data needs, cost, possible participants
 - Other tasks identified by the full Committee
-

Potential Sub-Committee #3 Options for Future Permitting Criteria (15)

- Recommend we wait until there are some recommendations from Subcommittees #1 and #2
 - Review current permitting criteria and compare to other states
 - Consider options for incorporating accurate land subsidence and salt water intrusion into the model, including review of land subsidence model package being tested by DEQ
 - Considerations for withdrawals near/impacting the fall line
 - Consider permitting implications/incentives of any alternative sources of supply recommended by subcommittee #1 or full Committee
 - Consider permitting implications of any alternative management structures recommended by subcommittee #2 or full Committee
 - For each option, evaluate statutory/regulatory needs, data needs, costs
 - Other tasks identified by the full Committee
-

Potential Sub-Committee #4 Options for Data Needs (15)

- Recommend we wait until there are some recommendations from Subcommittees #1, #2, and #3
- Identify data needs for continuous improvement of analysis tools, including, but not limited to groundwater modeling of head declines, subsidence, and saltwater intrusion
- Identify data needs for implementation of any alternative management structures recommended by subcommittee #2 or full Committee
- Identify data needs for implementation of any future permitting criteria recommended by subcommittee #3 or full Committee
- Other tasks identified by the full Committee

Potential Sub-Committee #5 Options for Funding (15)

- Recommend we wait until there are some recommendations from Subcommittees #1, #2, and #3
- Identify funding needs for implementation of any alternative water supply source development incentives recommended by subcommittee #1 or full Committee
- Identify data funding needs for implementation of any alternative management structures recommended by subcommittee #2 or full Committee
- Identify funding needs for implementation of any future permitting criteria recommended by subcommittee #3 or full Committee
- Identify funding needs for acquisition of data, continuous improvement of analysis tools recommended by subcommittee #4 or full Committee
- Identify supportable funding mechanisms
- Other tasks identified by the full Committee

-
- The hope is that the main committee and these sub-committees will be able to have a dynamic dialogue throughout the process. You may have items that you want one of the sub-committees to work through or vet and provide information back to you – so that you have summary information or more detailed information to help you make your decisions.
 - The rest of the calendar year the primary work would be conducted by the 2 major sub-committees (#1 & #2).
 - The idea behind this structured sub-committee approach is that those work groups provide information to the main committee and then this group's role is to sift through that information and make some policy decisions and recommendations as part of their report.
 - Another option, if the group needs some detailed technical information or financial information we could contemplate the prospect of getting a contract with an institute of higher learning to provide that information or analysis. There may be other sources of information that we could look at too. The idea is to determine the most efficient and effective way to get needed information to the committee for consideration in the development of the final report and recommendations. Either the full committee or one of the sub-committees could flesh out the contractual and information needs. The funding for such a process has not been determined or identified at this time.
 - The make-up of the committees and the different types of knowledge base for the various subcommittees was discussed. There are different technical; data as well as policy knowledge needs and issues depending on the subcommittee that need to be included or considered.

- A suggestion was made to include someone that was knowledgeable of the Building Code – i.e., someone familiar with the Universal Building Code such as someone from the Department of Building and Community Development to one of the work group.
- What follows the sections for each sub-committee that represents the charges to the groups is an initial list of potential members or potential organizations that should be included on the sub-committees. These are folks who we either know have expertise in these areas or people who have requested to be included in the process. This is not an exhaustive list. The task before the group is to help identify any individuals or interest areas that should be included that we have not identified.
- Mark Rubin, the facilitator for the group would like to keep the work groups/sub-committees to no more than 15 members if possible.
- James City County would like to be included on Sub-committee #1 as opposed to Sub-committee #2.
- **QUESTION:** What will be the protocol that will govern the work groups/sub-committees?
RESPONSE: It will operate under the same FOIA and procedural rules followed by the Advisory Committee. The work groups/sub-committees will be considered as public bodies and all of their meetings will be considered public meetings and the distribution of information will follow the same procedures as the main advisory committee.

ACTION ITEM: The members of the advisory committee were requested to provide their suggestions and recommendations as to their involvement and any nominations (either names or organizations) for membership of the 5 work groups/sub-committees either during the meeting or by the close-of-business on Thursday, August 20th to Bill Norris.

- The idea is to have the most appropriate person from an organization included on the sub-committees and involved in the discussions based on the subject matter being discussed.
- The concept originally was to have individuals other than those who are members of the Advisory Committee involved with the sub-committees, but members of the Advisory Committee are welcome to be as involved in the sub-committees as they feel comfortable.
- **QUESTION:** Where would these subcommittees meet? **RESPONSE:** Historically, we have met here in Richmond. But there may be an opportunity to meet in other locations than a DEQ office, if the logistics can be handled.
- **QUESTIONS:** Are there surface water options included? Is the topic or option for the use of shallow-water wells included in these discussions? **RESPONSE:** Primarily, streams, rivers and reservoirs tend to be what is considered as part of the surface water aquifer. We certainly have been making greater use of the water table aquifer, i.e., through shallow-water wells, to take the stress off of the deeper system. That is certainly one of the options that we would want included in the discussions.

ACTION ITEM: The group was requested to look at both the "who" and the "what" for each of the sub-committees – if there are issues that are not identified or included in the list for each sub-committee, please include those in your suggestions and recommendations. We need to make sure that we identify all of the necessary stakeholders and interest groups as well as all of the topic areas and issues that need to be addressed.

9. **Strawman work plan discussion (Scott Kudlas):** A tentative work plan for the committee and workgroups was distributed. Beyond the first couple of meetings it is not very detailed, because we are interested in you helping to set those agendas.

Initial Meeting - 8/18/15

- Welcome/Introductions
- Overview of Committee Charge
- Description of the process, ground rules, work groups, work plan discussion, and FOIA compliance
 - Proposed workgroup/subcommittee structure
 - § #1 – Alternative Sources of Supply (including, but not limited to, water reclamation and reuse, groundwater recharge, desalination, surface water options, construction of storage reservoirs)
 - § #2 - Alternative Management Structures (including but not limited to water resource trading program, formation of a long-term groundwater management committee, formation of a commission)
 - § #3 – Future Permitting Criteria – should wait until there are some recommendations from 1 and 2
 - § #4 – Data – may be driven by recommendations of #1, #2, and #3
 - § #5 – Funding – may be driven by recommendations of #1, #2, and #3
 - Discussion of subcommittee membership with the Committee
 - Discussion or work plan strawman
- Presentation from DEQ on nature of the problem
- Committee identification of problems
- Scheduling

Subcommittee #1 Meeting – Week of 9/14/15

- Focus on Reclamation and Reuse/Groundwater Recharge Options
 - Presentation of HRSD Project(s) – recharge & reuse
 - Presentation by Hanover/Clear Creek - recharge
 - Presentation by New Kent - reuse
 - Discussion of needs to evaluate technical feasibility and costs
 - Discussion of impediments to options
-

Subcommittee #2 Meeting – Week of 9/14/15

- Focus on Trading and Mitigation Options
 - Presentation by Kurt Stephenson/others
 - Presentation on mitigation by MH2O/others
-

Meeting Number 2 – 9/21/15

- Report of Subcommittees #1 and #2
 - Report and presentations identified by subcommittees/full Committee
 - Discussion of issues
 - Direction to subcommittees
-

Subcommittee #1 Meeting – week of 10/05/15

- § Evaluate Pros/Cons of alternative sources: Reuse/GW Recharge
 - § Identify additional information needed to evaluate, including potential speakers to full Committee
 - § Presentation and discussion of data needed to more fully determine feasibility of alternative sources
-

Subcommittee #2 Meeting – Week of 10/05/15

- § Evaluate Pros/Cons of alternative management structures: Trading/Mitigation
 - § Identify additional information needed to evaluate, including potential speakers to full Committee
 - § Presentation and discussion of data needed to more fully determine feasibility of alternative management structures
-

- This is a very ambitious schedule. The tentative schedule is set for the group to meet 4 more times before the end of the year on September 21st; October 23rd; November 19th and December 14th.
- Tentatively the proposed schedule for the subcommittee meetings (#1 & #2) would be the week of September 14th; October 5th and November 2nd.
- A suggestion was made that in order to provide time for the subcommittees to actually have time to for the sub-committees to get going and be able to do any productive work that they would probably need to meet at least twice before the next meeting of the Advisory Committee. It was suggested that the proposed September 21st meeting of the Advisory Committee be cancelled to allow time for the sub-committees to meet and be able to make some reportable progress. The group agreed that seemed to be appropriate.

ACTION ITEM: The proposed September 21st meeting of the Advisory Committee will be cancelled and possible used as a meeting of the sub-committees.

- **QUESTION:** How will this group communicate to the work groups if they have something that they want the sub-committee to look at? **RESPONSE:** That type of request should be routed to Bill Norris for distribution to the appropriate work group/sub-committee members and staff.
- It was suggested that there be an attempt to not hold two subcommittees on different days during any given week. A suggestion was made that if there was a 4 hour session instead of all day then both subcommittees could meet on a single day to eliminate the need for an organization to have someone out of the office on multi-days during a week for this effort. The idea is to be as flexible and as inclusion as possible throughout this process so that we can get the perspectives that are needed.

10. Workplan – Starting Point for Sub-Committees #1 and #2 (Scott Kudlas):

Scott Kudlas noted the following:

- We have a lot of varied and interesting work being done in the reuse and artificial recharge arena in terms of some feasibility work – it is a very timely issue to be discussed. Some of the folks conducting reclamation and reuse projects that have resulted in a reduction of groundwater use that would be willing to share that current information. The thought is that the alternative source group could look at some of those issues. One of the things that we could get presentations on would be the work being done down in Hampton Roads by HRSD in looking the feasibility of some artificial groundwater recharge projects. Other localities are looking at projects/options for artificial recharge along the fall-line that might provide some useful and timely information for the group. New Kent County moved a very significant portion of their non-potable water to reuse, which might be another project to hear from.
- It was suggested that it might be good and useful to have information on population forecasts and growth.
- From an agricultural perspective, information related to lakes; stream; and impoundments should also be considered and included in the discussions. **QUESTION:** The more water that can be withdrawn from a surface water source, does that help this problem with groundwater? **RESPONSE:** Yes, that is one of the options for this group to look at. To determine what the potential is for this type of alternative.
- **QUESTION:** RE: Recharge Areas: Do we have a map that identifies the recharge areas that should be protected throughout the state? Do we know where they are located? **RESPONSE:** The concept of recharge areas is not particularly useful in the context of regional scale groundwater. Different points along the fall-line serve as recharge areas but where those locations are may contribute more or less to the groundwater supply. The concept of recharge areas applies more readily to our water table aquifer. If you have a water table aquifer and it rains on that area then it pretty much recharges that aquifer, i.e., in the vicinity of a well. The

confined aquifer system is very different; the recharge is where it comes to the surface and becomes an unconfined aquifer. The deeper part of the aquifer, the coastal plain system, almost all of the recharge occurs along I-95 along the fall-line. In terms of water that falls on the areas of the fall-line, that water doesn't reach Franklin until 40,000 years later.

- A suggestion was made that we should also seek information from other coastal states to see how they are handling management of their groundwater resources. In addition, we could look at International efforts. There are a fair number of other state activities that could also provide additional useful information to the group.
- **QUESTION:** Are there impacts from neighboring localities and/or neighboring states that need to be considered? It appears that we have put a defined box around this issue, but we should not exclude consideration of possible neighboring impacts or influences on the system.
RESPONSE: This will included as part of the discussions from a regional perspective to help identify any interconnections between the coastal plain areas and neighboring impacts and influences. The report by Kurt Stephenson looks at some of those interconnections.
- **QUESTION:** Will the subcommittee addressing technology be tasked with determining the costs for implementation of those technologies? **RESPONSE:** The hope is that the members of the sub-committee will be involved in that determination, either themselves or through another vehicle to help define those costs and the impacts on localities of the implementation of any new technologies.
- It was noted that the task for the sub-committee dealing with Funding (Sub-committee #5) is a different than Costs. It was noted that the difference was intended and evident in the legislation that created this committee.
- It was suggested that as we go down the path looking at mitigation and technology solutions that there may be a conflict with public policy that would need to be taken into consideration. There will probably need to be for this group to prioritize any solutions or recommendations that come out of this committee.
- In terms of the sub-committee (#2) addressing "Alternative Management Approaches", one of the things that have come up the most in conversations is a very strong interest in looking at some kind of trading mechanism as a way of addressing this issue. One of the things that DEQ did was to have the economic report done that Dr. Stephenson wrote. There is an opportunity for him to present his findings on trading mechanisms and issues to the group.
- Mission H2O has also developed some information related to a mitigation program that might be useful to share with the group.
- It was suggested that it might be appropriate to include discussions on regional solutions and the development of possible incentives for the use of regional solutions. This has been raised by Mission H2O and other organizations.
- It was suggested that the group should have access to the report by Kurt Stephenson that was referenced in the discussions.

ACTION ITEM: The report by Kurt Stephenson will be routed to the members of the committee and posted to the appropriate webpage as soon as it is available.

11. Issues/Wrap-up (Mark Rubin):

Mark Rubin reminded the group of the need to look at both the "who" and the "what" of the process. This is just the starting point. For anyone on the "outside" it is important for everyone to sign-in and provide their contact information so that they can receive the information from the meeting. The power point presentation will be made available as soon as possible after the meeting as well as the two documents related to the work groups/sub-committees.

ACTION ITEM: Bill Norris will make the power point presentation as well as the documents related to the work group/sub-committees. The report by Kurt Stephenson will also be made available.

Mark Rubin addressed the procedural issue related to the use of proxies:

- For the Advisory Group the use of proxies is not allowed – each of the members of the committee has been selected as the "recommenders" and representatives of their respective organizations and they need to be part of the discussions and negotiations. If you cannot be here and want to send someone to listen to the discussions that will be find but that individual would not be at the table and would not have a vote in any negotiation or discussion or making recommendations by the Advisory Committee.
- For the work groups/sub-committees there is no issue for the use of proxies or alternates.

12. Next Meeting of Advisory Committee: Friday, October 23rd from 1:00 to 4:00

13. Anything for the Good of the Order/Public Comment:

No public comment was offered.

14. Meeting Adjournment:

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

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