GROUNDWATER RECHARGE STAKEHOLDER ADVISORY GROUP

MEETING NOTES - FINAL
ADVISORY GROUP MEETING – TUESDAY, JANUARY 24, 2012
DEQ PIEDMONT REGIONAL OFFICE TRAINING ROOM

Meeting Attendees

STAKEHOLDERS	*INTERESTED PUBLIC*	*TECHNICAL SUPPORT*
Larry Dame – New Kent County – Public Utilities	Tal Day – Diocese of Virginia	John Aulbach - VDH
Greg Evanylo – VA TECH	Vernon Land – City of Suffolk	Marcia Degen – VDH
Larry Foster – AWWA VA Section/Newport News Waterworks	Mike Lang – New Kent County – Public Utilities – Alternate for Larry Dame	Dan Horne - VDH
Chris Harbin – City of Norfolk Utilities	David Maxwell - Dewberry	Karen Johnson – EPA – Via Phone
Ron Harris – Newport News Waterworks	Gina Shaw – City of Norfolk	Wes Kleene - VDH
Whitney Katchmark – Hampton Roads PDC		Scott Kudlas – DEQ
Craig Maples – City of Chesapeake Public Works		Barry Matthews – VDH
Peter McDonough – Golf Course Superintendents Association		Randy McFarland – USGS
Britt McMillan – Eastern Shore of Virginia Groundwater Committee		Angela Neilan - DEQ
Clifton Parker IV – Aqua America		Bill Norris – DEQ
Jim Pletl – Hampton Roads Sanitation District		Valerie Rourke – DEQ
Cameron Tana – HydroMetrics Water Resources, Inc.		Neil Zahradka – DEQ
Cabell Vest – VAMWA		
Brent Waters – Golder Associates		
Andrea Wortzel – Alternate for Michael Lawless – Mission H2O		

NOTE: The following Stakeholder Advisory Group Members were absent from the meeting: Peter Brooks – PMBA; Ed Fleischer – CH2M Hill; Janet Herman – UVA & Michael Lawless – Mission H2O

1. Welcome & Introductions (Angela Neilan and Bill Norris):

Bill Norris, Regulatory Analyst with the DEQ Office of Regulatory Affairs, welcomed everyone to the 2nd meeting of the Groundwater Recharge Stakeholders Advisory Group. He asked for introductions of those attending today's meeting. He noted that he had received communications from several of the Advisory Group members stating that they would not be able to attend today's meeting. He noted the following:

- Dr. Janet Herman – UVA -will not be attending due to conflicts with getting the semester started.
- Mike Lawless – Mission H2O - will be out of town and unable to attend, but has requested to have Andrea Wortzel sit in as Mission H2O's representative. He stated the following in his note:

"I think that the discussions that we had at the first meeting were constructive and hopefully this next one will allow the regulatory and technical issues to continue to be fleshed out. As I mentioned at the last meeting, I think it is important that the group consider the issues surrounding groundwater recharge on a statewide basis and not limit the discussion to the Coastal Plain. Although we currently have a better understanding of the hydrogeology in the Coastal Plain compared to the other areas of the state that should not preclude the possibility of artificial groundwater recharge with adequate data collection and hydrogeologic characterization; at least not at this early stage in the discussions. An important consideration is the impact the Chesapeake Bay TMDL will have on areas outside of the Coastal Plain. There will be many WWTPs and other dischargers seeking alternative treatment and discharge options in order to meet the necessary waste load allocation. Groundwater recharge could be an important component of these options. New Hampshire has developed guidance for land disposal of reclaimed wastewater that may be useful for review. We may eventually determine that the risks outweigh the potential benefits in the areas of the state underlain by bedrock; however, in my opinion it is too early to remove these areas from the discussions.

- Tim Sexton with DCR will be unable to attend.
- Peter Brooks – PMBA Environmental Services – has a work conflict and will be unable to attend. He provided one comment regarding "Potential Regulatory Actions" – He noted that the section should read: "VDH *"Alternative Onsite Sewage System"* regs allow construction of large alternative onsite sewage systems. A section of the GW recharge regulations should address onsite disposal in the same manner as land application systems that are regulated by SCAT regs…"
- Ed Fleischer –CH2M – will be unable to attend.
- Ron Harris and Britt McMillan will be arriving late.
- Leita Bennett – requested to be removed from the stakeholder advisory group on 1/3/12. Status changed to an interested party.

2. Meeting Notes – December 1, 2011 (Bill Norris):

Bill Norris asked if there were any changes or clarifications needed in the December 1, 2011 meeting notes. A statement related to a "polling of the group" found on Page 25 of the draft notes was revised to reflect the consensus of the group. The statement was revised to read: "…the group felt that you could consolidate the disparate pieces of other regulations that address groundwater recharge and consolidate them into one regulation or program."

ACTION ITEM: Staff revised the meeting notes and posted them as "final".

3. Presentation on the EPA SDWA Underground Injection Control Program (Karen Johnson, Chief Of EPA's Ground Water and Enforcement Division – EPA Region III:

Karen Johnson, EPA Region III's Chief of Ground Water and Enforcement (participating by phone) presented an overview of EPA's Underground Injection Control (UIC) Program – Regulation of Disposal Wells in Virginia. Her presentation included the following information:

- The 1974 Safe Drinking Water Act (SDWA) – UIC Basic Concepts:
    - Requires EPA to promulgate regulations to protect Drinking Water Sources from

Contamination by Underground Injection of fluids.
    - Defines:
        - Underground Injection;
        - Endangering Drinking Water Sources
    - Designed to be Implemented by States
- What is the (UIC) Program?
    - The UIC Program:
        - Protects Underground Sources of Drinking Water (USDWs) from Contamination; *(Future and current sources.)*
        - Regulates Emplacement of Fluids into the Subsurface (Underground Injection); *(Includes a variety of high-tech and a lot of low-tech wells. Looking at "creating a pressure cone" not a "cone of depression".)* and is
        - Implemented by EPA, States (~30), and Tribes (1).
- Key Definitions – USDW: *(Everything boils down to definitions.)*
    - Underground Source of Drinking Water (USDW):
        - Either Contains less than 10,000 mg/L Total Dissolved Solids or
        - An Aquifer or Portion of an Aquifer which supplies any public water system or contains a quantity of groundwater sufficient to supply a public water system, and
        - Is not an Exempted Aquifer. *(There are no exempted aquifers in Virginia.)*
    - The UIC Program prohibits the injection of fluids or the movement of fluids that may pose a **"potential endangerment"** to a USDW. Endangerment is when any contaminant may exceed drinking water standards. *(Any injection well, whether "rule authorized" or "permitted" cannot allow "potential endangerment". Everything east of the Mississippi was identified as "protected". The line in the sand for any determination is the "potential for endangerment" in saying whether a well can be permitted or rule authorized.)*
- Diagram: Underground Source of Drinking Water includes:
    - Drinkable Quality Water (<3,000 TDS) and
    - Usable Quality Water (3,000 – 10,000 TDS)
    - Brine – Salt Water (>10,000 TDS)
    - *Everything from 10,000 to 0 TDS is protected under the UIC program.*
- Key Definitions – Exempted Aquifer: *(There are provisions for exempting an aquifer – have not exempted any aquifers in Virginia.)*
    - A USDW *aquifer* may be exempted from UIC regulations because it:
        - Contains oil or minerals; or
        - Is not a current source of drinking water and will not serve as a source because recovery is impracticable; or
        - Is so contaminated that it is economically and technically impracticable to be fit for drinking water; or Is located over a Class III (mining) area subject to collapse; or
        - Contains TDS greater than 3,000 but less than 10,000 and it is not expected to supply a public water system.
- What is an Injection Well?
    - Defined in SDWA:
        - "Well" – A bored, drilled, of driven shaft, or a dug hole, whose depth is greater

than the largest surface dimension. *(Deeper than it is wide.)*
    - "Well Injection" – The emplacement of fluids through a well as defined above.
- The UIC Program does not include:
    - Hydrofracturing process *(unless it is using diesel fuel)* specifically exempted from the SDWA and the UIC program;
    - Storage of natural gas also not regulated by UIC *(because it is not a liquid at standard temperature and pressure)*;
    - Does not regulate surface features (buildings, roads, well placement, tanks, ponds, pipelines, etc.) associated with the injection wells *(State and local jurisdiction governs these activities.)*; and
    - Does not include pits/ponds or lagoons for ground water infiltration. *(A basin is not an injection well; it is a pond or a pit – a rapid infiltration basin is not an injection well.)*
- Key definitions – Six Classes of Wells:
    - Class I – Deep Hazardous Waste or Municipal Waste Injection Wells; *(Industrially generated/related waste included.)*
    - Class II – Associated with Oil and Natural Gas (IIR = Enhanced Recovery, IID = Brine Disposal);
    - Class III – Associated with Mineral Recovery *(There are some salt production wells in Virginia that fall into this class.)*;
    - Class IV – Prohibited since 1985 – Shallow Hazardous or Radioactive Waste Injection Wells;
    - Class V – Injection Wells not in Class I, II, III, or IV *(About 40 different varieties of Class V wells.)*; and
    - Class VI – Carbon Sequestration *(This class has been recently added to the list)*.
- Current Active Virginia Inventory:
    - Class I – 0; (*Had one in Virginia – The operator decided that they could market the salt so it has been closed.)*
    - Class IIR (Enhanced Recovery) – *0;*
    - Class IID (Brine Disposal) – *8 Active for Coal Bed Methane Brine Disposal;*
    - Class III – *4 Solution mining wells – have a recent permit to add additional wells;*
    - Class IV – *0;*
    - Class V – *12,000+; (Most are stormwater; geothermal heat pump wells and septic system drainfields serving > 20 persons.)*
    - Class VI – *None Proposed. (None proposed in entire EPA Region III.)*
- Types of Injection Wells: *(Individual septic systems are NOT injection wells; however septic system drain fields serving > 20 persons are classified as injection wells.)*

Codes	**Descriptions**
00	No Wells
1C	CO2 Sequestration *(This is now classified as Class VI – as of December 2011.)*
1H	Hazardous Industrial
1I	Non-Hazardous Industrial
1M	Municipal
1R	Radioactive Waste Disposal
1W	Drinking Water Treatment Residual

1X	Other
2A	Annular Disposal
2C	CO2 Sequestration
2D	Produced Fluid Disposal
2H	Hydrocarbon Storage
2M	Coal Bed Methane Hydro-fracturing wells
2R	Enhanced Recovery
2RM	Monitoring Wells
2W	Drinking Water Treatment Residual
2X	Other
3A	Salt Solution Mining
3C	Copper Mining
3G	In Situ Gasification
3N	Nacholite Mining
3S	Sulfur Mining
3U	Uranium Mining
3X	Other Minerals
4A	Authorized as part of RCRA or CERA Cleanup
4P	Prohibited Activity

- Class V Well Types *(there are about 40 different types)*: *(Most of the 12,000+ Class V wells do not have permits. They were identified through field inspections – amassed over the last 30 years. Gas stations used to have floor drains that were connected to septic systems – most of those have been changed to "dry" systems. Most are "Rule Authorized"- a determination has been made that there is no potential for endangerment. Class I, II, & III are "permitted". Class V wells are generally "rule authorized" if a determination has been made that there is no potential for endangerment.)*

Codes	**Descriptions**
5A1	Carwashes
5A10	Machine and Welding shops
5A11	Medical service facilities
5A12	Pesticide application service facilities
5A13	Photographic processing facilities
5A14	Printing facilities
5A15	Veterinary, kennel and pet grooming service facilities
5A16	Metal plating/fabrication facilities
5A17	Equipment manufacturing/repair plants
5A18	Cooling Water with No Additives
5A19	Cooling Water with Additives
5A2	Carwashes where no engine or undercarriage washing is performed
5A20	Food processing operations
BA21	Small engine repair shops
5A22	CO2 Sequestration
5A23	Drinking Water Treatment Residual

5A24	Any other wells used to inject non-hazardous waste waters generated by industrial, commercial, and service establishments and that are not included in one of the other Class V categories
5A3	Appliance service and repair facilities
5A4	Beauty Shops/Barber Shops
5A5	Nail Salons
5A6	Dry Cleaners
5A7	Laundromats where no on-site dry cleaning is performed
5A8	Funeral Service
5A9	Wood/Furniture finishing facilities
5B1	Aquifer Recharge
5B2	Salt Water Intrusion Barrier
5B3	Subsidence Control
5B4	Aquifer Storage and Recovery
5B6	Subsurface Environment Remediation
5C1	Wells used to inject spent brines after the extraction of minerals from produced fluids
5C2	Wells used to inject heat pump return fluids
5C3	(Direct Heat) Wells used to inject fluids that have undergone chemical alteration during the production of geothermal energy for heating, aquaculture, or production of electric power
5C4	(Electric Power Return) Wells used to inject fluids that have undergone chemical alteration during the production of geothermal energy for heating, aquaculture, or production of electric power
5C5	(Groundwater Aquaculture Return Flow) Wells used to inject fluids that have undergone chemical alteration during the production of geothermal energy for heating, aquaculture, or production of electric power
5D	Wells used to inject treated effluent from POTWs or privately owned treatment works receiving solely sanitary waste
5E	Cesspools having the capacity to serve 20 persons or more per day and used solely for the subsurface emplacement of sanitary waste
5F	Septic tank and subsurface fluid distribution system having the capacity to serve 20 persons or more per day and used solely for the subsurface emplacement of sanitary waste
5G1	(Other Experimental Technology) Injection wells used in experimental technologies
5G2	(CO2 Sequestration) Injection wells used in experimental technologies
5H1	(Stormwater Drainage) Wells used to drain surface and subsurface fluids, including stormwater runoff and agriculture drainage that may have the potential to receive insignificant amounts of waste due to small volume leaks, drips, or spills
5H2	(Agriculture Drainage) Wells used to drain surface and subsurface fluids, including stormwater runoff and agriculture drainage that may have the potential to receive insignificant amounts of waste due to small volume leaks, drips, or spills
5H3	(Other) Wells used to drain surface and subsurface fluids, including

	stormwater runoff and agriculture drainage that may have the potential to receive insignificant amounts of waste due to small volume leaks, drips, or spills
5H3	Improve Sinkholes
5H3	Industrial Drainage
5I	Wells used to inject materials into mined out portions of subsurface mines, whether what is injected is a radioactive waste or not, including (1) slurries of sand, gravel, cement, mill tailings/refuse, fly ash, or other solids and (2) mine drainage
5J	Waste Discharge Well
5K	Wells used to inject fluids from motor vehicle repair or maintenance activities, such as an auto body repair shop, automotive repair shop, car dealership, specialty repair shop (e.g., transmission and muffler repair shop) or any vehicular repair
5L1	(Solution Mining) Wells used to inject fluids for the purpose of producing minerals or energy, which are not Class II or III wells
5L2	(In Situ Fossil Fuel Recovery) Wells used to inject fluids for the purpose of producing minerals or energy, which are not Class II or III wells

(There is one aquifer storage and recovery well in Chesapeake, as part of the City of Chesapeake municipal waterworks. There are a number of stormwater wells in Virginia – there are about 80 in the Roanoke area that were constructed.)

- UIC Program History in Virginia:
  - Protects USDW's from all types of injection;
  - UIC program regulations promulgated in July, 1980;
  - EPA began direct implementation of Virginia program in June, 1984; &
  - Virginia specific requirements 40 CFR 147.2350-2352
    - No Aquifer exemptions
- Diagram of Injection Well (displayed and discussed)
- Brine Disposal: (Most of the Class II wells in Virginia are for Brine Disposal related to coal bed methane.)
  - Wells typically converted from unproductive or depleted gas production wells;
  - Little research on other potential saline disposal zones;
  - Most disposal formation data obtained from past drilling history or injectivity testing
- Class II Wells – Construction and Operating Requirements:
  - Usually have 3 layers of protection:
    - Surface casing cemented to surface and cemented long string casing to total depth, injection string on a packer;
    - Must pass a Mechanical Integrity Test (MIT) every 5 years
  - May have multi-well area permits (Can cover more than one well – Have not issued an area permit for brine disposal.)
- Permit Issuance Process:
  - No application fee;
  - Offer Pre-Application conference with operators;
  - Application forms available on regional Web site;

    - One-stop shopping: Permit issued for construction, operation, monitoring and reporting;
    - Processing generally takes between 3-6 months; &
    - Public notification and opportunity for public hearing required (Notifications usually cover a 1-mile radius from the well. The area of review is usually within 1/4 mile or 1/2 mile from the well.)
- EPA UIC Permitting:
    - Major Permitting Requirements:
        - Defining Area of Review/Zone of Endangering Influence;
        - Injection well construction (**Depth of surface casing critical**);
        - Well operation (**Maximum Injection Pressure and Injection Rates**);
        - Mechanical integrity testing;
        - Plugging and abandonment; &
        - Financial Responsibility
- Diagram of Area of Review (displayed and discussed)
- Responsibilities of a UIC Operator:
    - Do not endanger USDW's; (Basis is the protection of underground sources of drinking water.)
    - Observe, Measure, and Record Injection Parameters and Any Other Permit Parameters;
    - Maintain Mechanical Integrity and Periodically Demonstrate Mechanical Integrity (MIT);
    - Report to UIC Director as Required:
        - Monitoring Parameters;
        - Loss of Mechanical Integrity (Within 24 hours); &
        - Noncompliance with Rule or Permit requirements
- Rule Authorization: (Rule Authorization is not a permit but is a way to add to the inventory. Non-endangerment determination is the key.)
    - Used for existing or new wells following a determination of "non-endangerment";
    - No "Permit" but added to the inventory, often have sampling requirements;
    - Required to operate without endangerment to USDW's; and
    - Usually used for Class V wells unless a permit is required. Might include:
        - UST remediation wells; &
        - Septic systems
- Inspections:
    - EPA is authorized to inspect any facility subject to the UIC program under Section 1445(b) of the SDWA (These are cold-call inspections. These inspections have been done in the past by EPA personnel and by EPA Service Employees. There used to be two Service Employees in Virginia, but now there is only one.)
    - Types of Inspections:
        - Pre-operational/pre-permitting;
        - Mechanical Integrity Testing (Class II and III only);
        - Operational/Compliance;
        - Plugging and Abandonment; &
        - Routine Operational.
- Inspections in Virginia 2006 – Present: (There are areas of the Eastern Shore that have not been looked at too closely. The lack of travel funds and the loss of one Service Employee have limited the number of inspections in recent years.)

- Class 2 D Wells:
  - 2006 – 0;
  - 2007 – 9;
  - 2008 – 9;
  - 2009 – 2;
  - 2010 – 1
- Class V Wells:
  - 2006 – 215;
  - 2007 – 213;
  - 2008 – 153;
  - 2009 – 143;
  - 2010 – 131

Ms. Johnson's presentation was followed by a period for questions and answers ,and discussions that included the following:

- The determination of "potential for endangerment" is the key.
- Rapid infiltration basins (like stormwater detention basins) are broader than they are deep. The design does not meet the definition of a well so therefore is not covered under the EPA UIC program.
- To be covered under the program the structure has to meet the definition of a well.
- A structure with French drains and subsurface leach fields with a large distribution box or an infiltration gallery (piping underground) is "injection".
- For a Class V well – if it is effluent from a POTW and contains more than just sanitary wastewater (i.e., industrial wastewater), it would have to be evaluated as a Class I Municipal Well. Injection would have to be into a formation below the lower most underground source of drinking water. Florida and Louisiana have quite a few of these types of wells. Delaware had considered one but has opted not to. There have been no requests made for this type of well in Virginia.
- The idea that this group has been considering regarding the injection of highly treated waste water into a drinking water aquifer would not be allowed under the current federal regulations, unless the aquifer was exempted. EPA has not favored aquifer exemptions for the purpose of pollution. This practice would be allowed if it was limited to groundwater recharge through surface infiltration but not through injection into wells – not into an underground source of drinking water. Some states have geology such that they are able to inject below the lower most source of drinking water.
- There is one aquifer storage and recovery well in Virginia that injects treated drinking water into a USDW for storage during periods of high surface water flows, and the injected water is then recovered for drinking water purposes during periods of low surface flow (this was the original concept – the operating practices have changed a bit, as a result of changes in source water and purchased finished water availability).
- Question from the SAG: If you have treated wastewater to drinking water standards could you inject it into a potable aquifer? You would have to look at the constituents in the treated water. There is potential for pharmaceutical and a whole lot of other things that could be missed in a scan for drinking water standards. You would have to ensure that there are not any unique

chemicals that would be of concern. There have been instances of aquifer compatibility issues that would need to be considered (release of arsenic; evidence of higher fluoride, etc.). A compatibility analysis would need to be conducted for any type of discharge. The basis is that you can not endanger.

- States with primacy must have standards at least as stringent as the federal program.
- Reverse osmosis is currently the highest tech treatment available. California is using this approach in their draft groundwater recharge regulations (but also considers RO in concert with other advanced technologies).
- The drinking water standards would supercede whatever source is providing wastewater. Suitability analysis would also be required to ensure the quality of the aquifer would not be degraded.
- Question from the SAG: If you have municipal wastewater with significant industrial users but you are able to treat to drinking water standards in order to inject it into a USDW, could this practice be authorized under a Class I permit? Yes you could, but if you are going to be treating to such a high level, why wouldn't you use it for irrigation or other type of additional polishing that could be used as a source or even used as drinking water rather than injecting it. Constructing and operating a Class I well would be very costly. Finding a suitable formation would be difficult. Extensive monitoring would be required. There are less costly means of handling the water, i.e., disposal through a POTW or through other means that are less costly than a deep disposal well.
- A Class I well by definition cannot inject into an Underground Source of Drinking Water.
- If the water is treated to drinking water standards you would want to put it into surface water or a shallower aquifer for reuse through infiltration for polishing through stone and soil so that it is not lost to the active water cycle.
- Question from the SAG: If wastewater is treated to drinking water standards and then injected into a USDW, what well type would be required? If it is a shallow disposal well and is from a POTW that only takes sanitary waste, it could potentially be a Class V. If it is a POTW that takes any industrial or any other non-sanitary waste (i.e., from car washes), it would have to go into a Class I well which means that it would have to go below the lower most USDW.
- You have to monitor what is going in as well as what is being removed.
- EPA classifies a septic system that has received industrial waste as an "abused septic system".
- EPA has no jurisdiction over state and local rules and regulations.
- For a project that is deemed to have "no potential for endangerment" then a permit would not be issued but it would be added to the inventory and given a "rule authorization".
- There is no money for Virginia related to primacy. The state got money several years ago to evaluate the issue and decided not to seek primacy, so there is no additional funding available at this point for the state to develop their regulations. The discussions today have centered on Class V primacy. There is no partial primacy that only addresses Class V wells. Class II & Class VI are the only well classes that a state can seek primacy for as stand-alone programs. With one you get all. If Virginia requested Class V primacy, they would have to seek primacy for Class I, III, IV, & V at a minimum and the EPA could then run Class II & VI. The question related to primacy is an all or nothing scenario. Is DEQ willing to take on all of the other areas to have primacy? (EPA noted in correspondence dated January 4, 2012 that: "When the states

and EPA have joint primacy, it is usually the State that runs the Class II Oil and Gas Program and/or the Class III Mining programs and EPA runs the rest." – That would mean that Virginia could ask for a Class III program as well as a Class V program primacy.)

- If conditions of the DEQ permit that the operator would be following are the same as those required by EPA and ensure no endangerment of the USDW, then EPA would not likely issue a permit but would use a "rule authorization". The state has state jurisdiction to issue certain permits. For those areas where there are also federal requirements, the same requirements, definitions, etc. should be reflected in the state regulation. If the state program doesn't contain similar requirements then it is up to the operator to register with EPA's inventory. It is not likely that the state would come up with any regulations that would interfere with EPA's UIC program. EPA has limited personnel, so rule authorizations are preferred. EPA would prohibit activities with potential for endangerment.
- Question from SAG: What about stormwater (Class V) wells? Is the nonendangerment determination generally that the water does not enter into a drinking water aquifer or is it based on the water quality of the stormwater? It is based on the water quality of the stormwater. Basically, the current determination is that everything from the surface to within 1/4 mile of the surface is considered an aquifer, essentially everything East of the Mississippi. All aquifers must be protected. The process is that if stormwater is being discharged, EPA has to make a determination whether there is a potential for endangerment, basically that there is a lack of protection from anything that would degrade the quality of the groundwater.
- Roanoke has about 80 wells that predate the UIC program that are on the inventory. It is the only area that has that large a concentration of wells in Virginia.
- The Chesapeake injection well project was originally issued a permit, not a rule authorization. EPA decided in 1999 to let the permit expire and to allow the well via a rule authorization. It was one of EPA's first technically oriented Class V wells. The permit required submission of an annual reporting of water quality in both injected and recovered water.
- Similar projects would require a permit.
- The Chesapeake well is controlled wholly by the Water Utility and they do all of the monitoring.

4. Discussion of UIC Program and Interaction with DEQ (Angela Neilan and All):

Valerie Rourke presented information downloaded from the EPA's UIC Program Website. Within this information, she highlighted the following items for the group:

- Injection wells are regulated within the framework of five classes of wells, dependent primarily upon the nature of the injected fluid. Generally speaking, injection wells are either "deep" (discharge below the lowermost USDW) or "shallow" (discharge into or above the USDW). This distinction is important. Deep wells isolate the injected fluids from USDWs requiring strict adherence to well construction and operating requirements. Shallow wells discharge directly into or above the resource requiring protection demanding a thorough evaluation of the chemical nature of the injected fluid.
- Class I wells are deep wells that inject hazardous and non-hazardous waste below the lowermost USDW.

- Class V wells are injection wells that are not included in the other classes. Some Class V wells are technologically advanced wastewater disposal systems used by industry, but most are "low-tech" wells, such as septic systems and cesspools. Generally, they are shallow and depend upon gravity to drain or "inject" liquid waste into the ground above or into underground sources of drinking water. Their simple construction provides little or no protection against possible ground water contamination, so it is important to control what goes into them.
- UIC Program Primacy – For a state to gain authority over all classes of wells or Class I, II, III, V, and VI, state programs must be as stringent as the federal program and show that their regulations contain effective minimum requirements (e.g., inspection, monitoring, and recordkeeping requirements that well owners and operators must meet). State regulations must be as stringent as the federal requirements, but may be more stringent. Such states are authorized under section 1422 of the SDWA.
- EPA has delegated primacy for all well classes to 33 states and 3 territories; it shares responsibility with 7 states (i.e., EPA has authority over some classes and the state has authority for others).
- Aquifer Recharge (AR) and Aquifer Storage & Recovery (ASR): Artificial aquifer recharge (AR) is the enhancement of natural ground water supplies using man-made conveyances such as infiltration basins or injection wells. Aquifer storage and recovery (ASR) is a specific type of AR practiced with the purpose of both augmenting groundwater resources and recovering the water in the future for various uses.
- Although the process of ASR includes the production of the injected water, the UIC program does not regulate recovery activities.
- Conventional methods of AR include surface spreading, infiltration pits and basins in addition to injection wells. Injection wells are the selected method of artificial recharge in areas where the existence of impermeable strata between the surface and the aquifer makes recharge by surface infiltration impractical or in areas where land for surface spreading is limited.
- UIC Regulations for AR and ASR wells: ASR wells are regulated as Class V injection wells. If the owner or operator submits the inventory information and operate the well in a manner that does not endanger a USDW, the well is typically authorized by rule. However, a primacy state or EPA, in the case of a state without primacy, may require a permit for a Class V well. State-specific ASR regulations do not supersede the prohibition of movement of fluid into a USDW. Specifically, EPA regulations provide that "no owner or operator shall construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of fluid containing any contaminant into underground sources of drinking water, if the presence of threat contaminant may cause a violation of any primary drinking water regulation under 40 CFR part 142 or may otherwise adversely affect the health of persons." (40 CFR 144.12).
- Water injected into ASR wells typically meets or is treated to meet primary drinking water standards as required by several state regulatory agencies to prevent degradation of the ambient groundwater quality. Depending on the type and quality of injectate and/or the geology, the potential for endangering a USDW may increase.
    - Pathogens may be introduced into an aquifer if injectate is not disinfected. The growth of microorganisms within the aquifer could cause decreased water recovery efficiency by clogging the wellscreen or risks to public health from contamination of the aquifer.

    - If water is disinfected prior to injection, the possibility of disinfection by-products (DBPs) forming in-situ increases. If soluble organic carbon is not removed from the injectate before disinfection, a chlorinated disinfectant may react with the carbon to form compounds such as trihalomethanes and haloacetic acids.
    - Chemical differences between the injectate and receiving aquifer may be different enough to create problems within the recharge aquifer.
    - Injected water has been known to cause the dissolution of metals such as arsenic, manganese, and iron from the surrounding geologic formation…While the presence of disinfection by-products has occurred in USDWs due to ASR activities, EPA is not aware of exceedances of applicable primary drinking water standards as of 2007.
- EPA Mid-Atlantic Region Contacts:
    - Karen D. Johnson (Johnson.karend@epa.gov); UIC Program Manager; Chief, Ground Water & Enforcement Branch (3WP22); US EPA Region 3; 1650 Arch Street; Philadelphia, PA 19103-2029; 212.814.5445
    - Mark Nelson (nelson.mark@epa.gov); Class V Team Leader and Technical Representative; 1060 Chapline Street; Wheeling, WV 26003-2995; 304.234.0286

Angela Neilan facilitated a group discussion on the UIC Program and interaction with DEQ.

Group discussions included the following:

- Water going in and being removed must be monitored.
- UIC does not regulate recovery activities.
- Chesapeake did not anticipate the problem with manganese that they encountered. They had to install additional equipment and facilities to address these issues.
- Water systems must adjust their operations to not mobilize contaminants – to prevent "potential endangerment". EPA can address through enforcement actions through the UIC program for wells that are permitted and the mobilization of contaminants was not anticipated beforehand. There have been instances in other states where arsenic and iron have been mobilized. There have been no arsenic issues identified in Virginia.
- A septic system that receives industrial waste is considered "an abused septic system" by EPA. It doesn't have the capacity to treat "industrial waste" because of its design.
- At the point of injection you must meet drinking water standards or better. EPA's point of compliance is the well, at the point where the water enters the well.
- Is DEQ willing to take on all of the other areas to take on primacy for this issue? EPA has primacy for all types of wells in Virginia. There is a currently a duplicative permitting process with DMME. If a state has duplicative regulations it doesn't mean that you have to seek primacy. There doesn't appear to be a benefit for DEQ to seek primacy.
- The group's task was to evaluate the recharge of groundwater with either wastewater or stormwater. The federal limitations on the quality of water that can be recharged into groundwater don’t make recharge with wastewater or stormwater sound very encouraging. If

expansion of groundwater recharge options is impossible, perhaps the existing Virginia regulations that have allowed existing projects does not need to be expanded.

- EPA uses the Maximum Contaminant Levels (MCLs) from the SDWA for determination of "non-endangerment".
- Groundwater recharge/injection seems to be unlikely in Virginia.
- The Ground Water Standards include "antidegradation standards". The location of the nearest drinking water or private wells is not always known, so the Ground Water Standards try to be as protective as possible. Surrounding monitoring wells would be required so that the wells could be evaluated on a case-by-case basis.
- Are there any other means of injection rather than underground injections wells? Yes, you can use rapid infiltration basins or vadose zone wells.
- Under current regulations you can put this "groundwater recharge water" into rapid infiltration basins but not into a drainfield or injection well. Water put into a rapid infiltration basin has to meet Ground Water Standards, numerical and narrative (Antidegradation policy).
- A septic system/drainfield is designed to treat/biodegrade biological types of waste, not industrial waste.
- A family septic system does not violate the "potential for endangerment" criteria.
- The evaluation of the "potential for endangerment" is a "process based" evaluation. What is being disposed of into a septic system instead of a public sanitary sewer needs to be considered for multi-use facilities and areas.
- The compatibility of the water that would be used for recharge would need to be examined. You essentially have to "fingerprint' the water, to make it look like the water that is being discharged into.
- Need to look at this as a resource investment and as a long-term improvement process. Need to identify any other resource impacts. What are the resource costs involved (not just economic) on a long-term basis? There may be competing resource impacts.
- The issue is the "potential for endangerment". Need to use the best available technology to treat the water. Have limits put in place that you would not be endangering the quality of the water for use in public and private wells.
- The big question is "If you can't drink it, why would you want to put it into the ground and then have someone pull it back out to drink?"
- Drinking water standards have to be met. Need to treat to drinking water standards.
- One of the problems is that there a lot of private well owners who have no level of treatment for the waters.
- Generally, if it is industrial wastewater it is classified as a Class I well.
- The draft California recharge regs have been draft for about 20 years. They set out a treatment standard and technique, require monitoring for contaminants of emerging concern (including pharmaceuticals), and include a time of travel consideration.
- EPA has determined that "surface only car washes" that have no "under carriage" wash, that "containerize any spills", use only biodegradable detergents, do not store any antifreeze or other fluids on site, and segregate any salt residue from their over-carriage wash operation, are not

endangering. An operation that has a potential for spills and does undercarriage steam cleaning has the potential for endangerment.

5. Additional Thoughts from Morning Session (Angela Neilan)

Angela Neilan asked for introductions from those joining the group for the afternoon session.

The group was asked if they had any additional thoughts that they would like to share from the morning's discussions. The following items were brought up and discussed by the group:

- It was noted that the "wind had gone from the sails of group" based on the presentation by EPA.
- It was noted that there were additional restraints that now needed to be considered.
- The question was asked whether all of the EPA Regions follow the same rules. It was suggested that there may have been a different set of rules that were being used in North Carolina. Implementation might be different from region to region based on different interpretations.

ACTION ITEM: Members of the group that have additional information will route that information to Bill Norris for distribution to the group.

- Related to industrial wastewater discharges from car washes to drainfields, there are also folks who have breweries and who do wine making, most of which have drainfields. They are rarely ever permitted; they are "rule authorized". Unsure what EPA's criteria are for calling it "industrial".
- There are a lot of smaller localities that have shopping centers with uses that are permitted for a drainfield. As different clients move into the spaces and uses change, do you go back and check each time a client changes? No, you normally don't. EPA relies on their service employees in the area.
- Overview of Chesapeake ASR well– Got into ASR in the late 80's when Chesapeake was very water poor. Needed it as a source to meet peaking demands. Started injecting in 1989, it was difficult to have enough surplus to actually inject. Once they got 80 or so million gallons in the ground, they did a full scale withdrawal as a test for the system. That is when the problem with manganese was discovered. They installed equipment to address the problem. In 2006, they opened the Lake Gaston treatment plant which is a "base-load" plant. They have a contract with the City of Norfolk for 7 MGD. With the availability of that supply, they almost never withdraw from the ASR. It serves a very different purpose now – a lot of times, just before the morning demand period starts, it is a place to get rid of some water – that is when the bulk of the injection is done. They have 1.5 billion gallons in the ground now. It is a Class V UIC facility, authorized by rule. The City holds a Groundwater Withdrawal Permit which covers the ASR well, as well as other wells which provide source water for the city’s RO plant. The city also has other state permits from VDH and DEQ.

6. **Review of Key Points from the December 1, 2011 meeting for Future Discussion by the Stakeholder Advisory Group (Valerie Rourke & Angela Neilan)**

Valerie Rourke presented key points that DEQ staff identified and consolidated from the December 1, 2011 meeting notes. She asked the group to verify that the key points were clearly and appropriately captured. The key points included:

1. From a resource management perspective rather than a disposal perspective, groundwater recharge needs to be more strategic. **A regulatory mechanism should be developed for groundwater recharge within an overarching water management program for the state.** Groundwater recharge should be permitted in those locations where it will have the greatest benefit to the resource in terms of both quantity and quality.
2. **Should we develop groundwater regulations that are:**
    A. **Comprehensive and applicable statewide.** Need to look at this from a statewide perspective rather than one that is limited to the Coastal Plain.
    B. **Applicable to only specific regions of the state.** Concentrate efforts in those areas of the state where we have some information. If groundwater recharge works there, then expand it to other areas of the state. Optionally, divide the regulation by physiographic provinces. There are different groundwater conditions in areas of the state that need to be addressed. There is not a one-size-fits-all solution.
    C. **Or a combination of these approaches?**
3. If you don't know the conditions of the aquifer to be recharged, you don't know what can be put in the ground. **Whatever option is chosen to develop a groundwater recharge regulation, there is virtually no data outside the Coastal Plain. Additional geochemical and hydrological data are needed on a statewide basis to evaluate groundwater recharge projects.** This will be a difficult task.
4. **There should be some kind of regulation that would combine parts of other regulations as a kind of one-stop regulatory process for groundwater recharge.**
5. **What level of treatment is needed for water used to recharge groundwater?** Treating to drinking water standards would be expensive.
6. **Ensure that groundwater recharge does not result in nutrient loads to surface waters** where the two are hydrologically connected, particularly where the surface water has TMDLs for nutrients.
7. **Stormwater could also be used to recharge groundwater** through rapid infiltration basins designed to manage (treat and dispose of) stormwater. Stormwater flows can be significant and some areas might benefit from the use of stormwater for groundwater recharge.
8. **Standards for groundwater recharge should apply to any water used for recharge, regardless of source. Standards should be established for each end-use or categories of end-uses, not for the source water.** Where developed on a case-by-case basis, the standards should be established for the protection of the existing use and existing systems.
9. **The Groundwater Standards 99VAC25-280 should be revised to better address groundwater recharge.**

It was noted that items #4 should be rewritten to include both the concept of a regulation and a process or program that would combine parts of other regulations as a kind of one-stop regulatory process for groundwater recharge. There is a process or program that is needed, not necessarily a regulation.

ACTION ITEM: Staff will rephrase the statement both here and in the meeting notes to reflect this concept.

In addition to key points for further discussion, DEQ staff identified other key points from the 12/1/11 meeting notes that did not warrant further discussion until a regulatory action was initiated. She again asked the group to verify that these points were clearly and appropriately identified, and noted that they could be moved to the preceding category of key points if the group felt they need discussion preceding a regulatory action. Other key points to be noted included:

1. Focus on groundwater recharge as a beneficial reuse, not on the types of water used for recharge (e.g., reclaimed water, stormwater, surface water, etc.).
2. Consider linking groundwater withdrawal limits with groundwater recharges.
3. Quality and quantity are two major issues regarding groundwater recharge. Regardless of the purpose of recharge, it will affect the quality of the groundwater.
4. Learn from approaches and experience of other states (e.g., California, Arizona, etc.) regarding groundwater recharge with reclaimed water.
5. Monitoring of groundwater recharge facilities is needed to verify that they are in compliance with the conditions of their issued by DEQ. Groundwater quality should be monitored for chemical and biological parameters.
6. Must be able to convince the local rate payers that groundwater recharge is a good investment. This relates to public perception of the activity.
7. An advantage of groundwater recharge is that it provides water storage. Storage ensures a more constant and reliable supply of water throughout the year. Water supply reliability is important to the public and a significant factor in terms of gaining public acceptance.
8. Additional DEQ staff would be needed for a groundwater recharge program.
9. Funding for pilot studies of groundwater recharge projects should be made available.

A question was raised related to item #1 in this list: With the need in the future to address MS4 permits, how are you going to be able to use stormwater for groundwater recharge? How do you marry that into the program? How do localities deal with the need for credits for stormwater? In the future, the concern will be about stormwater management. Staff noted that stormwater should be considered as we move forward with this process.

Consensus Items: There were a limited number of items on which the group reached consensus at the last meeting. They included the following:

- **Groundwater recharge with reclaimed water should be an option, not a mandate.**
- **There are conflicting or duplicative regulations that need to be taken into consideration.**

- **Disparate pieces of other regulations that address groundwater recharge should be consolidated into one regulation.**

ACTION ITEM: The third item in the consensus list will be changed to include the concept of both a "regulation" and a "program". The statement would read:

- **Disparate pieces of other regulations that address groundwater recharge should be consolidated into one regulation or program.**

Action Items: Action items were also identified in the 12/1/11 meeting notes requiring DEQ follow-up. These included:

- **Staff will determine how much more groundwater is being extracted from the Potomac System than is generally being recharged and provide that information to the group. – This information was distributed to the group via email.** (Provided to group before meeting.)
- **Staff will determine the number of states that have primacy over the EPA UIC program and provide that information to the group. – This information was distributed to the group via email.** (Provided to group before meeting.)
- **Staff will extract pieces of regulations that would be affected by either a single or multiple regulatory action(s) for consideration by the group. (**This information was presented during the afternoon session.)

7. DEQ Water Division regulations that may be part of a regulatory action for groundwater recharge and discussion (Valerie Rourke & Angela Neilan)

Valerie Rourke provided an overview of DEQ Water Division regulations that may be part of a regulatory action for groundwater recharge. (See Potential Regulatory Actions for Groundwater Recharge document dated January 2012 for full references.) Her overview included the following:

- There are summaries of 7 existing regulations included in this document with a place-holder for a possible additional regulation. Each of the regulation summaries is divided into an "existing language" section, which is provided as a reference, and a "comments" section, which identifies potential issues and possible regulatory changes that might be considered.

Item # 1: New Regulation or Amendments for Groundwater Recharge: The Water Division regulations typically fall into three categories: technical (e.g., SCAT Regulations; Water Reclamation and Reuse Regulations), permit (e.g., VPDES Permit Regulation, VPA Permit Regulation, Groundwater Withdrawal Regulation), and standards (State Water Quality Standards, Ground Water Standards). This is done to avoid circumstances where a change to technical, permitting and/or standard requirements in one regulation could requires the same change(s) to be made in several other regulations as part of the same regulation action to ensure consistency; and to avoid regulations that are

redundant of each other and unnecessarily large and cumbersome. Instead, a regulation typically incorporates by reference the applicable sections of another regulation that specifically addresses technical issues, permitting, or standards that it would otherwise lack.

- At this time the division anticipates that the regulation for groundwater recharge will be a permit regulation that incorporates by references the Ground Water Standards, the SCAT Regulations and possibly other technical and standards, regulations or design documents.

Group discussions included the following:

- Right now a permit regulation is envisioned for groundwater recharge as a starting point for the discussions. How do you take credit for groundwater withdrawal with recharge/injection activities?
- This could be an amendment to an existing regulation or set of regulations or it could be a new regulation to include the requirements of groundwater recharge.
- There are other beneficial uses for the water that may need to be considered or need to be included in other regulations.
- What is an example of a permit regulation? Define a permit regulation. If you look at the VPDES regulation as an example of a permit regulation, it tells you who has a duty to apply (who has to get the permit); the process for application for a permit; there is some reference to how you put that the permit together. The permit regulation is like the parent regulation that would determine whether you need a permit or need to be part of a program. The permit regulation sets the boundaries. The Biosolids Regulation is not a good example – it contains components of all of the types of options noted above – permitting; standards and technical.
- A permit would normally include: limits that are based on standards; special conditions; schedules (when to start construction; reporting schedules; monitoring reports); & boiler plate language from federal regulations.
- How do we make this beneficial? If you pump x million gallons in can you pump x million gallons out? How do you get credit for putting it in the ground?
- Could you do groundwater recharge in Virginia today? In theory you could. But it is not a simple process. We are not talking about allowing something that is currently not allowed, just trying to make it easier to do or endorse the concept. The Antidegradation policy needs to be taken into account.
- It is hard to find a solid direct benefit of groundwater recharge – can't get a one to one benefit. The finances would make it prohibitive.
- Would it be helpful to consider "categories" of use that might fit better into one regulation as opposed to fitting them into another one? Some types of projects would fit better in different regulations.
- Need a program that serves as an umbrella to cover all of the aspects of groundwater recharge.

- Need to focus all on the same thing. Need to address groundwater recharge that is meaningful. Need to agree on what we want to focus on. The difference between "disposal" and "recharge" should be considered.
- What is the goal of the group?
- Could we just do a technical regulation? That would seem to be closer to an umbrella type of regulation.
- Going back to where this started – why can't we just put this back into the Groundwater Withdrawal Permit Regulations? Because of the Groundwater Standards.

Item #2 – Ground Water Withdrawal Regulations (9VAC25-610):

- Per 9VAC25-610-110 D 4 b of the Groundwater Withdrawal Regulation, it is possible to issue a Groundwater Withdrawal permit for a groundwater withdrawal that proposes an associated aquifer storage and recovery system. This provision does not restrict the type of water to be used for aquifer storage and recovery and would, thereby, allow the use of reclaimed water, stormwater, surface water, etc. for this purpose. This provision, however, does not address groundwater recharge for reuses that do not involve subsequent recovery or withdrawal if the reclaimed water, such as, but not limited to, creating a saltwater intrusion barrier or subsidence control.
- Per comments of the Groundwater Recharge SAG on 12/1/11, portions of other regulations affecting or pertaining to groundwater recharge should be relocated into one regulation specifically addressing groundwater recharge. However, the Groundwater Withdrawal Regulations have considerable existing language that could apply to both groundwater withdrawal and recharge, and could be either copied into a new regulation for groundwater recharge or amended to incorporate provisions more specific to ground water recharge. If the latter were to be implemented, the Groundwater Withdrawal Regulations could be amended to:
    - Allow groundwater recharge within and outside the boundaries of GMAs,
    - Allow groundwater recharge with or without an associated withdrawal where the recharge is not disposal; and
    - Authorize projects that involve both groundwater recharge and groundwater withdrawal under a single permit.

Group discussions included the following:

- This gets back to the suggestion made earlier to develop or amend a technical regulation to address groundwater recharge.
- Need to look at the purpose of the recharge.
- Need to have provisions within the Groundwater Withdrawal regulation.
- We are just looking at the options that are available for us to use.
- We could incorporate withdrawal into the Groundwater Recharge regulation.
- We were looking at options other than the use of reclaimed water.

- Is it limited to the area covered by the Groundwater Management Area? The Groundwater Management Act applies statewide. The regulations are set up for currently designated areas. There could be designated areas where recharge is specifically authorized. Those areas would need to be designated.
- The State Water Control Law is flexible enough to allow the development of groundwater recharge regulations.
- There may be different standards that may apply because of a declared designated groundwater management area because you are doing it for a different purpose. They could be evaluated on a case-by-case basis.
- In Virginia, the presumption is that all groundwater is of drinking water quality, which may not actually be the case. This could possibly be addressed through a "classification system". Virginia does not currently have a "classification system" in the Groundwater Standards.

Item #3: Virginia Pollution Abatement (VPA) Permit Regulation (9VAC25-32):

- This is a permit regulation (except for the biosolids part, which is a combination of the various types of regulations – permit, technical and standards).
- DEQ issues permits in accordance with the VPA Permit Regulation (9VAC25-32) for pollutant management activities that do not have a discharge to surface waters. These have most commonly included land treatment of municipal and industrial wastewater, and land application of biosolids, animal waste, industrial residuals or sludges, and stabilized septage.
- However, DEQ may also issue a VPA permit to authorize discharges to groundwater based on the very non-specific language contained in 9VAC25-32-30 of the regulation. The language is written so broadly that it could be used to allow groundwater recharge, but it has not been used for that purpose. Is this the regulation that should be modified to allow groundwater recharge?
- Per comments made by the members of the Groundwater Stakeholder Advisory Group at its December 1st meeting, portions of other regulations affecting or pertaining to groundwater recharge should or could be relocated into one regulation specifically addressing groundwater recharge. Provisions of the VPA Permit Regulation that currently allow it to authorize groundwater recharge projects may be minimally modified to transfer permitting of such projects from the VPA Permit Regulation to another Water Division regulation or to a new regulation or program.

Group discussions included the following:

- The VPA regulation has been used for above-ground (land-application) activities, i.e., animal waste, septage, industrial wastewater, etc.
- There have only been three Rapid Infiltration Basins authorized under the VPA permit program and not all are currently in operation. The VPA Permit Regulation has not been used for groundwater recharge activities in the past.

- The question is where would you draw the line between a land-treatment project and a groundwater recharge project? How do you identify which is which – then under what permit program?
- There needs to be a permit process to monitor the discharge to groundwater. Who is going to enforce the requirements of a groundwater recharge project? There has to be a strong enforcement mechanism. The VPA Permit Regulation is the place that you could handle other types of groundwater recharge. If you put the language for groundwater recharge in the Groundwater Withdrawal Regulations you would be directly tied to a withdrawal. The Groundwater Withdrawal Regulations are not the place for addressing groundwater recharge unless we are only looking at addressing groundwater recharge in the coastal plain (in a groundwater management area).
- Should tie any groundwater recharge project into an existing permit process for a facility (for a specific reuse). Shouldn't have to have another permitting action that would be needed.
- The use of a "technical regulation" would still seem to work by referencing all of the affected "permit regulations".
- Should put the "groundwater recharge" project requirements in a "technical regulation". Can then reference back through the "permitting regulation".

CONSENSUS: Need to explore/consider the development of a technical regulation to handle groundwater recharge. The permit regulations could reference the technical regulation. Appropriate amendments would need to be made to all of the other regulations.

- Who has the technical skills to manage the groundwater and water quality concerns? Technical staff would be needed. Who will be monitoring this process?
- To include this process, you would need to touch all of the referenced regulations that are being discussed today.
- There needs to be a simple process established to do this – there needs to be a workable solution.

Item #4: Sewage Collection and Treatment Regulation (SCAT) (9VAC25-790):

- Section 9VAC25-790-880 of the SCAT Regulations specifies design and operation requirements for land-treatment systems of sewage that include, among others, rapid infiltration basins (RIBs), and requires that all such systems be designed to meet the Groundwater Standards.
- Per the SCAT Regulations, RIBs must be designed, in part, to recover "renovated water using wells or under drains" for "subsequent reuse". Other functions of RIBs identified in the SCAT Regulations include groundwater recharge and recharge of surface streams by interception of ground water.
- The SCAT Regulations apply to only treatment facilities of sewage. RIBs are also being used in Virginia to treat and manage stormwater. Recommended designs for such systems are provided in the Virginia Stormwater Management Handbook (DCR, 1999). Regulations for

groundwater recharge could refer to the SCAT Regulations and the Virginia Stormwater Management Handbook for the appropriate design requirements for RIBs for sewage and stormwater, respectively.

- There are no similar technical references for the design of RIBs used to treat and manage other wastewaters, such as, but not limited to, gray water and industrial wastewater. The new regulations could include a statement that the design of such RIBs "shall be determined on a case-by-case basis relative to the contaminants present in the wastewater to be introduced to the basin and the groundwater standards that apply". Contaminants in industrial wastewater can vary widely depending on the nature of the industry from which they are generated. The inclusion of specific design requirements for the treatment of each of the various industrial wastewaters that could be used for groundwater recharge could make the regulation cumbersome and inflexible.
- While it may be appropriate to maintain design requirements for RIBs that receive treated sewage in the SCAT Regulations, it may be more useful to create a new subsection in the SCAT Regulation containing design requirements for all methods of groundwater recharge using treated water derived from sewage, including reclaimed water. Land treatment could be differentiated from groundwater recharge in that it may result in some groundwater recharge, but it would be "incidental" to uptake by the vegetation on the treatment site and evaporation.

Group discussions included the following:

- RIBs are used for more than just reclaimed water or treated municipal wastewater – they are also used for stormwater. There are different regulations that come into play depending on their use.
- DCR has a design manual for RIBs used for stormwater. It is a design manual, not a permitting mechanism.
- The concern is how to get credit for the groundwater recharge activity.
- The SCAT Regulations are stand-alone technical regulations that deal specifically with sewage. A separate technical regulation could pull together all of the different aspects or types of groundwater recharge.
- There could be different required standards of treatment depending on the source. The idea may be to look at it from a "water quality perspective" not from a source perspective.
- One of the benefits of groundwater recharge is getting credit on the groundwater withdrawal regulation side.
- RIBs in the SCAT Regulations only address sewage. The technical regulation language or language in other regulations needs to consider the other types of water that could be used for RIBs, industrial wastewater or stormwater.
- There needs to be flexibility to handle these types of projects and requirements on a case-by-case basis.
- The major limitation for this whole process is the availability of resources.
- A technical regulation is enforced though the requirements of a permit regulation.

- Another major limitation is "public perspective" – Have to show that we are protecting the drinking water resource.
- RIBs are currently under a section of the SCAT regulation called "Land Treatment" – there are other methods of groundwater recharge other that "rapid infiltration methods". We could develop a section in the technical regulation that could include rapid infiltration basins and their technical requirements and other methods of groundwater recharge. There appears to be a benefit to taking it out of the SCAT regulations and referencing it. There is however still a connection between "rapid infiltration basins" and "disposal of waste". RIBs are not considered a well – but all of the methods do have something in common – they all recharge groundwater. There could be design requirements for all types of recharge.
- The concept of rapid infiltration basins should be taken out of a regulation dealing strictly with land treatment and put into language where you are conceptually in a system where you are providing treated water directly to groundwater whether pressure or gravity.
- RIBs are really an extension of the treatment plant – it is a method of treatment and disposal of sewage disposal.
- Need to be careful how we are framing these discussions and possible solutions – are we disposing of wastewater or are we managing a resource? Disposal is related to lessened expectations. Need to be careful in our language.
- If it is "disposal" then identify it as such, if it is "recharge" you have to address differently.
- We have to start thinking about this as a product. Is it "reuse" or "disposal"?
- Groundwater recharge is a by-product of a rapid infiltration basin, but it is not its main purpose.

Item #5 Water Reclamation and Reuse Regulation (9VAC25-740): Due to lack of time, Valerie Rourke indicated that some of the regulations listed in the document would not be discussed until the next meeting of the group. These included the Water Reclamation and Reuse Regulation, the Water Resources Policy and the Fees for Permits and Certifications Regulation,

Item #6 Groundwater Standards (9VAC25-280): All groundwater recharge projects must comply, at a minimum with the Groundwater Standards, which currently include narrative and numerical standards for the protection of groundwater quality. During the initial meeting of the group it was discussed that the groundwater standards would need to be revised to accommodate the concept of groundwater recharge. Although discussion of needed revisions to the Groundwater Standards could take an entire meeting, Valerie Rourke initiated the group's discussion of the standards with a series of questions.

Group discussions included the following:

- **Do we need a "classification system"?**
    - An advantage to having a classification system is that you would have different types of treatment.
    - There are unintended consequences of using a classification system and categorizing localities across the state.

- Florida has a lot of classes – a lesser class gets the worst water for recharge.
- It would take longer to develop a classification system then it would be to develop regulations.
- This is something that will need further discussion – the conversation needs to start.

- **Do we need bacterial standards? – Should they incorporate by reference the groundwater standards (MCLs)?**
  - Beyond the scope of what has been discussed today.
  - There needs to be a robust discussion of the standards.

8. Public Input; Next Steps and Meeting Wrap-Up (Staff)

Staff asked members of the stakeholder advisory group and the public for any additional thoughts or ideas for the good of the Advisory Group's discussions.

- A request was made for any references that had been submitted to staff to be routed to the group for information. It was noted that to simplify the distribution of information, that staff would identify the links to the references and those links would be distributed to the group as information. In addition, any other references should be routed to Bill Norris for distribution to the group.
- An item that should be included on the next meeting agenda is the question of whether this is just a topic for groundwater management areas where we have groundwater depletion issues or for all areas throughout the state.
- Need to follow through on the key points from the last meeting and those developed as a result of this meeting to help guide future discussions.

No public comment was offered.

Staff noted that we will finish up on an overview of the regulations at the next meeting as well as continuing our discussions of the key points.

9. Next Meeting Date:

The next meeting of the Groundwater Recharge Stakeholders Advisory Group has been scheduled for **Tuesday, March 27, 2012 at the DEQ Piedmont Regional Office Training Room.** A meeting agenda and meeting materials will be distributed closer to the meeting date.

10. Meeting Adjournment:

DEQ staff thanked the Advisory Group members and the members of the interested public for their participation and contributions to the process. The meeting was adjourned at approximately 3:30 P.M.