MEETING OF THE NORTH CAROLINA
ENVIRONMENTAL MANAGEMENT COMMISSION

Raleigh, North Carolina
March 8, 2012
Minutes

The North Carolina Environmental Management Commission met in the Ground Floor Hearing Room of the Archdale Building, 512 North Salisbury Street, Raleigh, North Carolina. Chairman, Stephen T. Smith presided. The following persons attended for all or part of the meeting.

COMMISSION MEMBERS:

Christopher J. Ayers
Donnie Brewer
Marvin S. Cavanaugh
Marion E. Deerhake
Tom Ellis
William L. Hall
Steve P. Keen
Dr. Ernest W. Larkin
Kevin Martin
Dr. David H. Moreau
Dr. David Peden
Dr. Charles H. Peterson
Mayor Darryl D. Moss
J. Dickson Phillips III
Clyde "Butch" Smith, Jr.
Stephen Smith
Steve W. Tedder

DIVISION OF WATER QUALITY:

Bradley Bennett
Janice Bownes
Ted Bush
Kevin Bowden
Connie Brower
Amy Chapman
Alan Clark
Nora Deamer
Bethany Georgoulias
Deborah Gore
John Huisman
Steve Kaasa
Elizabeth Kountis
Matt Matthews
Sandra Moore
Diane Reid
Jon Risgaard
Jason Robinson
Jay Sauber
Lois Thomas
Julie Ventaloro
Chuck Wakild

DIVISION OF AIR QUALITY:
Mike Abraczinskas
Joelle Burleson
Michael Petratjic
Sushma Masemore
Angela Terry

DIVISION OF WASTE MANAGEMENT:
Ruth Strauss
Debra Watts
Betty Gatano
Linda Smith

DIVISION OF WATER RESOURCES:
Tom Reeder
Sarah Young

ATTORNEY GENERAL'S OFFICE:
Frank Crawley

I. Preliminary Matters

Chairman Smith: Chairman Smith called the January 12, 2012 meeting to order at 9:10 a.m. He then read the Ethics General Statute § 138A-15, which mandates that the Chairman inquire as to whether any member knows of any known conflict of interest or potential appearance of conflict with respect to matters before the Commission. Commission members were asked if they knew of any conflict of interest or appearance of a conflict to please so state at this time.

Upon motion and second, the minutes of the January 12, 2012 meeting were approved.

The Commission expressed its appreciation for the service of past-EMC members Yvonne Bailey and Forrest Westall on the N.C. Mining Commission and to EMC members Marvin Cavanaugh and Les Hall for agreeing to fill those Mining Commission vacancies.

The Commission heard an update on the forthcoming EMC/DWQ Nutrient Forum to be held May 29 – 30 at the Sheraton Imperial Hotel in RTP.

12-06 Request for Proceed to Public Hearing with the Proposed Reclassification of a Segment of the Roanoke River along the Bertie County/Martin County Line to Class WS-IV Session Law 2011-394 Requirements

Summary (Elizabeth Kountis): I am here to ask the Commission for approval of the fiscal note for this proposed reclassification and permission to send it out to public notice and hearing.

The request was received from the Martin County Regional Water and Sewer Authority is for a portion of the Roanoke River straddling the Martin County/ Bertie County line which is to be reclassified from Class C to Class WS-IV including a critical area and protected area.

The reclassification is needed to construct the intake. This new water supply source will allow Martin County and the Town of Williamston to meet requirements of the Central Coastal Plain Capacity Use Area rule and meet water demands through 2030; thus, this proposal serves the public interest per Executive Order #70 and Session Law 2011-398. The Division of Water Resources staff has no objections to the proposal. A finding of no significant impact has been issued for this project, and the waters to be reclassified do meet water supply water quality standards according to 2011 DWQ studies. For your information, there is a long-term DWQ ambient monitoring station located approximately 1/3 mile below the proposed intake site.

If the subject area is reclassified, wastewater discharge and new development requirements will need to be implemented. Furthermore, in the Critical Area only, additional treatment will be required for new industrial process wastewater discharges, and no new landfills or land application sites will be allowed.

There is currently only one permitted wastewater discharge, a sand mine, within the proposed area. This facility is located in the proposed protected area and would not be impacted by the proposed reclassification based on its permit. There are also two animal operations and three land application sites in the proposed area that would not be affected by the proposal. These facilities are located in the protected area that is proposed.

There are no proposed land application sites or landfills in the proposed critical area and no planned wastewater discharges or developments in the entire proposed area. The area to be reclassified is a mixture of wetlands, forested lands, pasture/crop lands, and developed properties.

In addition, if the proposed area is reclassified, Bertie County, Martin County, and the Town of Williamston would be the local governments that would have to alter their water supply watershed protection ordinances to reflect the reclassification's requirements, because they are the local governments with jurisdiction in the proposed area. Resolutions have been received from these local governments. As a reminder, a resolution indicates if a potentially impacted local government will administer water supply rules within its jurisdiction once a water supply reclassification becomes effective. The fiscal analysis drafted for this proposal revealed a one-time cost of about $5,500 to Bertie County, $5,000 to Martin County, $3,500 to the Town of Williamston, and $2,400 to the state; thus, the proposal meets the requirements of SL 2011-13.

Finally, to be able to get necessary American Recovery and Reinvestment Act of 2009 funding, the proposed water treatment plant for this project must be able to operate by September 2015. Thus, the Martin County Regional Water and Sewer Authority requests that the reclassification become effective by early 2013. Considering this timeline request, we are requesting that the EMC approve the fiscal note for this proposed reclassification and approve sending the proposal out to public notice and hearing with the fiscal note. The proposed hearing will be held most likely this summer and the proposed reclassification's effective date is estimated to be January 1, 2013. I would be happy to answer any questions you may have.

Dr. Peterson moved for approval, seconded by Dr. Larkin. The motion passed unanimously.

12-07 Request for Approval of the Fiscal Analysis of Proposed Changes to Groundwater Rules 15A NCAC 2L .0202 (1, 1-DCE Groundwater Standard) and .0113 (Variance Procedures)

Sandra Moore: I am here today to present the results of the fiscal analysis for the proposed changes to Sections .0202 and .0113 of the 2L groundwater rules. I'm also here to request the Commission's approval of this fiscal analysis. The draft fiscal analysis is attachment A of your agenda item. Today I'll review the proposed rule revisions and the purpose. I'll summarize the estimated economic impact of the proposed rule to potentially affected parties. I'll address compliance with Executive Order 70 and other Administrative Procedure Act requirements and General Statute 150B. Finally I'll present an estimated timeline for the rulemaking process.

As you may recall at the July 2011 meeting the Commission approved three proposed rule change options to take to public hearing. After the public hearing and comment period the Commission will then decide which of these options or combination of options to adopt. The first option is a change in the 1,1-DCE groundwater standard from 7 ug/L to 350 ug/L as requested in a rulemaking petition submitted by McGuire Woods on behalf of Rhodia, Inc. This request was based on the availability of more recent EPA health effects data that show the current standard is more restrictive than it needs to be. The rulemaking petition was approved by the Groundwater Committee in May of 2011 and by the full Commission in July of 2011. Again, this option represents a change only in the 1,1-DCE standard from 7 ug/L to 350 ug/L. This proposed rule language is located in Appendix C of the fiscal analysis and the proposed changes are highlighted in yellow.

As a reminder, at the July meeting the Commission's General Counsel expressed concern about changing 1,1-DCE standard alone because 2L .0202d specifically requires that the groundwater standard be established as the lower of the six criteria listed in (d)(1) through (d)(6). For 1,1-DCE the lower of these six criteria is the federal maximum contaminant level

or MCL of 7 ug/L, however we acknowledged that the MCL has not been updated with the most recent health effects data and EPA acknowledges that it could be raised as high as 350 mg/L. Unfortunately they don't intend to change the MCL anytime in the future due to monetary constraints.

The Division of Water Quality concurs that the MCL and the 1,1-DCEgroundwater standard should be updated to 350 ug/L. The proposed language in option 2 would allow the EMC to establish a standard less stringent than the maximum contaminant level or secondary maximum contaminant level when MCL is not based on the most recent USEPA health effects data, such a standard would not endanger the public health and safety in compliance with the standard based on the MCL would produce serious hardship without equal benefit. This rule language addresses potential legal issues with establishing a standard higher than the MCL when the MCL is based on outdated health effects data, such as with the 1,1-DCE MCL. The proposed rule language for this option is located in Appendix D of the fiscal analysis.

When the issue with the outdated 1,1-DCE standard was first brought up by Rhodia, the Division of Water Quality and the Groundwater Committee believed that the current variance process could be used to address the issue without having to amend the groundwater rules. However, Rhodia did apply for a variance and found that the current variance process was not workable. Thus this third option is proposed to allow the EMC to consider a request for a statewide variance to the groundwater rules which could be used to request a less restrictive 1,1-DCE groundwater standard when it could be shown it would be protective of public health. There are some other proposed changes to the variance procedures that include updating a mailing address and some clarifications that were recommended by Chairman Smith.

I would like to note that this fiscal analysis assumes that the adoption of any one or combination of these three options would ultimately result in a higher 1,1-DCE groundwater standard and would result in the same fiscal analysis impacts. The Division of Water Quality conducted outreach to a number of potentially affected parties including members of the regulated community, environmental groups and state agencies. This information was then used to develop this fiscal analysis. Rhodia, Inc. was the only private industry identified as being immediately impacted by the proposed rule. Rhodia could see decreased cost in groundwater well monitoring and in operation and maintenance of their pump-and-treat groundwater remediation system. This is discussed in more depth in the fiscal analysis. The North Carolina Department of Environment and Natural Resources Division of Waste Management could see opportunity cost savings in the form of less oversight of Rhodia, assuming Rhodia's groundwater cleanup time would be reduced. The North Carolina Department of Transportation could realize cost savings due to reduced 1,1-DCE reporting requirements for 18 asphalt testing sites with releases of chlorinated solvents where 1,1-DCE is currently below 350 ug/L. There could be other private industries other than Rhodia that would realize cost savings even though none were identified through our outreach, and this is addressed in the risk analysis section of the fiscal analysis. Also, there could be potential impacts to public and private water supply systems and this is also addressed in the risk analysis section, which I will go over briefly later in my presentation.

These proposed rules are considered non substantial economic impact because the aggregate impact on all affected persons is less than 500,000 dollars in a 12 month period. I believe there is a typo on the fiscal analysis indicating that it is substantial, but it is not substantial. This will be corrected before it goes out to public comment. The fiscal note has

been approved by the DENR budget office and is currently being reviewed by the Office of State Budget and Management. The existing 2L groundwater rules serve as the baseline for this analysis.

The groundwater rules are intended to maintain and preserve the quality of the groundwater of the state, prevent and abate groundwater contamination, protect public health and protect groundwater as a current and future drinking water resource. Where groundwater has been degraded the goal of any required corrective action system is to the level of the groundwater standards that have been established in 2L .0202. Current groundwater standard for 1,1-DCE is 7 mg/L. If it is changed to 350 mg/L regardless of which rule option or combination of options are adopted that would allow us to change the standard, then compliance cost and regulatory oversight would likely decrease.

Here are some of the areas identified in the fiscal analysis where potential cost savings may be realized if there's a release of 1,1-DCE to groundwater. If groundwater tested to determine the extent of the contamination above the standard. If the standard is raised then not as many groundwater wells will be needed to determine the plume boundary. Also the length of time that it takes to clean up the groundwater to the groundwater standard will be shorter if the standard is raised to 350 mg/L and the corrective action system would not have to operate quite as long, resulting in operation maintenance cost savings. The fiscal analysis estimates a 15 year reduction for Rhodia in the operation and maintenance of its corrective action system. Also, a smaller plume may allow the use of more economic cleanup technology. If the standards change to 350 mg/L then existing monitoring wells that now meet that proposed standard could be closed and monitoring cost saved.

In its rulemaking petition Rhodia identified ten wells that it could close immediately. A shorter cleanup time would reduce the number of years of regulatory oversight for state agencies resulting in opportunity cost savings such as report review meetings, letter writing and site visits. For Rhodia alone this is estimated as 15 years of reduced oversight. The only cost that was identified with these proposed rules would be the closing of monitoring wells that meet the proposed standard and they must be closed in accordance with the North Carolina 2C .0113 regulations at an estimated cost of $520 per well, and this would be a onetime cost. The total benefits and costs of potentially impacted parties associated with the proposed rule change are spread out over a thirty year period and assume a 2% annual inflation rate. Again Rhodia is the only company that was identified as being immediately affected and the cost would be approximately $5,200 to close ten wells. The benefits over the next thirty years for the state DENR and Department of Transportation are estimated to be approximately $30,000; and for Rhodia over the next thirty years up to $866,000. As I mentioned, a risk analysis was performed that examines factors or possible events that may jeopardize the anticipated benefits or may increase the cost of the proposed rule change. One possible event would be the presence of other contaminants that require further action once the 1,1-DCE meets the proposed standard. Then no benefits would be expected for a party under this scenario. Also, there could be current or future parties that have 1,1-DCE contamination that would benefit from this proposed rule that have not been identified at this time. If a 1,1-DCE groundwater release impacts the source of drinking water above the maximum contaminant level of 7 mg/L, then the responsible party would be required to clean up to the 7 mg/L rather than 350 mg/L and wouldn't see a cost savings as a result of this proposed rule. Finally if a public water supply source is contaminated above the enforceable

MCL of 7 mg/L and the responsible party is not identified, that may create additional treatment costs for a public or private water supply system.

We also looked at a couple of rule alternatives, one leaving the standard at 7 mg/L and another, a value in between 7 mg/L and 350 mg/L, but we determined that neither of these options was reasonable.

As you know the Administrative Procedure Act rulemaking process has been amended by recent legislation and Executive Order #70 and certification is now required from the EMC and the Office of State Budget Management that the proposed rules meet the principles and requirements of Executive Order #70 and General Statute 150B-19.1 and 19.3. We have determined that the proposed rules do meet these requirements. They are authorized by state law and they serve the public interest by reducing regulatory burden without sacrificing public health and safety. They are based on sound reasonably available scientific and technical information.

If the EMC approves the fiscal analysis today and the Office of State Budget approves the fiscal analysis by the end of March, we believe we can meet the deadline to publish in the May 1st North Carolina Register, and then hold hearings and a public comment period between May and June, come back to the Commission in September with the hearing officers report, and then proceed to the Rules Review Committee in October. If approved and ten letters of objection are not received, then we have a potential effective date of November 1st for this proposed rule. The proposed rules were already approved to go to public hearing at the July 2011 EMC meeting. All we need today is approval of the fiscal note and that is our recommendation. That concludes my presentation. Thank you.

Lengthy discussion ensued, followed by a motion and second to approve the fiscal note. The motion passed unanimously.

12-08 Request for Approval of the Fiscal Analysis of Proposed Changes to Rulemaking Petition Rules 15A NCAC 2I .0501

Sandra Moore: Attachment A is the fiscal analysis. I will go over the proposed rule revisions and the purpose, summarize the potential economic impacts, address the compliance with Executive Order 70, other general statute requirements and present an estimated timeline for this rulemaking.

At its July 2011 meeting the Commission passed a motion to amend 15A NCAC 2I .0501 to add a requirement to submit an electronic or digital copy of a rulemaking petition. This change is not expected to result in additional cost to the petitioner since electronic and digital submittal documents is already to be standard practice. It also removed the requirement to submit 20 paper copies if the petition exceeded 10 pages. It is estimated that by removing this requirement it would save the petitioner approximately $200 per petition. Appendix A of the fiscal note is a copy of the 2I .0501 rule with the proposed language highlighted in yellow. Again the Division of Water Quality conducted outreach to a number of potentially affected parties. The proposed rule amendment will potentially reduce the cost for private parties that submit a rulemaking petition in excess of 10 pages. Basically we look back at the last two rulemaking petitions and average the number of pages on those which were 104 pages and I will get into that a little bit more. The fiscal note has already been approved by both the DENR office and the Office of State Budget and Management, and has been determined to be de minimis rules with little or no impact on state funds, local or private entities. Again the estimated fiscal impacts, the total cost

would be nothing and the total savings would be $200 per petition. Major cost savings would be from the copying cost assuming the rulemaking petition is over 10 pages which would be approximately a hundred pages at $.10 per copy for 19 copies. The Division of Water Quality and the Office of State Budget Management had determined that the proposed rule complies with the principles of Executive Order 70 and General Statutes 150B-19.1 requirements. It reduces the cost associated with submitting the rulemaking petition. If approved today we would take it to public notice May 1st in the North Carolina Register and May through June and have a 60 day public comment period. We are not required to hold a public hearing since it's de minimis rules, and at that point bring it back to the EMC for approval in September, take it to the Rules Review Commission in October and possibly have an effective date of November 1, 2012. Our recommendation is to approve the fiscal note and the EMC has already approved the proposed rule. So we just need approval of the (**audio problem**)

Upon motion to approve with second, the motion passed unanimously.

12-09 Hearing Officers' Report on Public Comments Received on Proposed Revision of Injection Well Rules (15A NCAC 02C .0200)

The hearing officers for this item were Mr. Keen, Mr. Phillips and Mr. Hall.

Dickson Phillips: I was going to make a couple of introductory remarks but refer primarily to Mr. Slusser who along with other staff has been living and breathing these rules for a considerable period of time. There were four public hearings, Morganton, Raleigh, Williamston and Castle Hayne mostly in December and the first on November 30th in Morganton. All three hearing offices attended the first two and then Mr. Keen and Mr. Hall attended the last two in Williamston and Castle Hayne. There were not a large number of commenters at the public hearings. There were a number of more comments received in writing and the staff made a number of changes to the rules based on the comments. I assume Mr. Slusser will address some of those. I just wanted to highlight the theme from the hearings, the comments that were made at the hearings,centered on concerns and problems that had developed in the unintended interaction of the well drilling activity in nearby water supply wells in which pressures from drilling activity had caused nearby wells, and I think in one instance some sort of aquifer, not out of natural aquifer in the terminology that was used, blow out. In one instance, apparently a water supply well, the whole apparatus was literally blown out of the ground. Maybe Mr. Slusser can describe these other instances.

The other significant concern that was raised related to the construction activity had to do with installation of one of these systems in the eastern part of the state where the wells that had been sunken. Actually, they penetrated multiple aquifers. A significant concern was identified. One of the preferred grout materials, bentonite would not hold up under conditions where there was saline or chlorine in water. Rule changes may require or allow the use of different or to prohibit the use of bentonite where certain chemical composition of the water would pertain in the east.

These rules are very technical and actually concern a whole range of different forms of injection wells. I have a remaining concern which is whether we say in these rules enough or things that we might say to address the predicament a nearby property owner would find themselves in if one of these instances occurs where the drilling activity on neighbor's property or nearby property results in complete destruction and ruining of their water supply. It was

considered by the staff as to whether or not the rules could provide some form of liability for the driller or the owner in those situations. I think they were properly counseled by the Attorney General that these rules could not create, that would really be a matter for the legislature in legislation to create any form of liability.

There was a change made in these rules first to require that in the construction process that control of any water that may erupt during the process of drilling you use this high pressure water primarily and there were instances (which is a different problem) of operations losing control water leading to surface water contamination. There's a change made in the rules to say that you can't do that. It would be improper construction technique, and I think the rules speak very positively and says that you've got to conduct your construction in such a way as to control the surface water, not cause contamination. But there is no such provision saying that you've got to do your drilling in such a way that you're not going through these pressures injected below ground cause harm to some other land owner. The staff response on this issue to the concerns raised by some commenters on this is simply to say that the tort law provides a remedy there. That is true, however that's not much comfort to someone who suffers that experience and has to resort to a demand and potentially a lawsuit. After initially rejecting this notion, I would actually be in favor of making a slight change in the rule even as it's before you today to say at least that compliance with these rules is not to constitute a defense, liability to the third parties for property damage or personal injury caused by any of these activities. Staff could address where that might best go, to circle back the structure of these rules for the first time provides conditions under which certain of these wells are going to be permitted by rule. They will be proceeding without any prior permitting process and without any ongoing inspection. We wouldn't want the notion of just because they complied with the provisions of the permit by rule sections that somehow they insulated them should they blow out a neighbor's well. I don't think that would necessarily be a good legal argument but potential interaction with other subsurface water supply facilities is a problem that is very difficult to predict and to fight against. In that context, I think it would be useful for us to say just compliance with this rule is not in any way intended to be a defense should you blow out somebody else's well.

Another potential measure which is not in the rule but I think we could talk about is whether there should be some financial responsibility requirement for it. With that and having raised issues that Mr. Slusser is not aware of I was going to raise this morning, I'll turn that over to him.

Thomas Slusser: This process has been way too easy so far so we have a little challenge here. I'm quite pleased to have made it this far in the rulemaking process. We had a lot of hard work from staff, folks in other divisions in the Department and the Office of State Budget and Management. Our hearing officers did a good job of helping us get through this process as well and raise some good issues and bring a different perspective that we don't have with our face in the rule all the time. Just as a refresher of the timeline in May of last year this Commission authorized the rules to go forward to public hearing. OSBM approved the fiscal note in August 2011. The rule was put in notice in the North Carolina Register in October 2011. In addition to that notice in accordance with the Well Construction Act we posted notice in the newspapers having general circulation in the state and we notified all the permit holders, notified the Well Contractors Certification Commission and other licensing boards that have an interest in these rules.

As mentioned these are existing rules that were last amended in 1997 fifteen years ago. By this change we are proposing rule revisions to reorganize the content, restructure it to make it easier to use, follow and make edits through the rulemaking process as needed in the future. Injection well construction practices and uses have changed so we are addressing those. We're looking at expanding permitting by rule for certain low risk injection activities. There have been some changes in the federal requirements and so we need to update our rules accordingly. We had a public comment period that ran from October to January. We had four public hearings scattered throughout the state. We receive approximately 170 comments. Most of those were written and dealt with some recommendations for comments for definitions. There are some technical improvements to some of the definitions and comments about phrasing. Other comments dealt with our major permitting areas for groundwater remediation, geo-thermal systems and aquifer storage recovery wells. There were some general comments about the protection of water quality, as Dixon mentioned. Surface water impacts from certain drilling activities to appropriate grout types in the coastal plain.

Mr. Phillips: Thomas you might just give everybody a refresher on what an injection well is and give them some idea of the scope if you weren't already planning to do that.

Thomas Slusser: Ok. An injection well is basically any well or any excavation that is used to place solids or fluids into the subsurface. The statutory definition of well is in the Well Construction Act and as explained in the proposed rules that injection is through a well for placing solids or fluids into the subsurface. This is a Federal Program that North Carolina has been granted authority to implement. So our rules need to meet the minimum federal requirements as well as implement the purpose and scope of the Well Construction Act.

Some of the changes that we made in response to the public comments had some economic impacts for aquifer storage recovery wells. We made the change in accordance with their recommendation to expand the time period for mechanical and integrity testing of the well which is a test used to make sure that the well maintains its construction characteristics that will protect water quality. The original proposal that went out for public hearing had a five year period of time those tests would need to be repeated. We thought there was some value in extending that time period out to ten years as a maximum. There certainly is some language in the proposed rule that would give the agency the discretion to require more frequent testing if necessary in order to enforce the provisions of the rule requirements.

Other changes that were made, groundwater remediation in which we had some comments about for one of the proposed permit by rule activities, which we call a small scale. An area that was intended to, for example if the home heating oil tank was overfilled and there's a contamination incident those kind of cleanups could be conducted without going through the permitting process. Still prior notification would be required of that area. That small scale area that went out for public hearing was 2,500 sq. ft. but there's some merit in expanding that out to 10,000 sq. ft. which is about a quarter of an acre, 100 ft. by 100 ft. area. That resulted in additional savings to the regulated community and the state.

Some other revisions that were made that did not have economic impacts deal with the geo thermal heating and cooling, as Dixon mentioned some of those issues. First, dealing with the grout issue the current regulation specifies that only cement grout can be used. In the proposed rule there is some value in allowing other types of grout to be used. Some of the comments expressed concern about the potential for this betonite grout to break down when chloride

concentration is in groundwater get to 1500 milligrams per liter or greater. Well construction standards in 2C .0100 specifies that bentonite grout cannot be used in groundwaters 1500 milligrams per liter or greater. Incorporating that change that's something that well drillers would already be familiar within the other set of well construction standards and called around to some other drillers. It was their perspective that this was a reasonable requirement that drillers should know as a matter of their professional practice. Also talked with some of the manufacturers of bentonite grout and some of their data sheets specifically mentioned that as well as when they conduct training seminars that well drillers attend for their continued education associated with that.

For geo- thermal heating and cooling systems in response to some of the concerns that were given about the potential impacts for surface water impacts of not managing the drilling fluids or the water that gets produced during the drilling process, we are proposing to expand the prior notification time period from two days to thirty days for commercial installations. Those are the ones that have the greatest potential to have adverse impacts with the great number of wells design, build and implements, construct systems and that time period was reasonable and fit within the already larger time frame in between when somebody wants to move forward with geo thermal and when construction actually should begin.

It was mentioned with the requirement to manage the produced waters and drilling fluids that's already something within the scope of a well driller's responsibility. We're adding language that would make that explicit requirement that they take plans to anticipate larger volumes than they might expect and to have the proper structures in place on site for doing that, and have those plans available on the construction site. Those are things that are within the scope of the professional practice that they aren't economic impacts associated with those. The changes that were made that did have economic impacts increased savings. They increased projected net savings from $700,000 in the first year up to $800,000 and that would also be estimated to increase in the fifth out to about $2.5 million net savings in the fifth year. If the Commission chose to adopt the rules today we would be able to submit those rules to the Rules Review Commission in April. Depending upon how that process goes it could become effective as early as May or possibly later if there are any issues to work out. That's a summary of things. If you have any questions I'd be happy to address those.

Chairman Smith: Any questions?

Dr. Moreau: Just as a point of information I was trying to go back through these rules quickly. There is a definition in there of hydraulic fracturing. Are these rules assumed to cover the fracturing issue or is that something that is to be considered in the future?

Thomas Slusser: That's something that's totally separate from this body of rules. That practice is not allowed in the state. There were some comments about that definition and this was kind of a back door way of letting in hydraulic fracturing for enhanced natural gas production. The answer is no because there are statutes and rules that specifically deal with that issue. That concept is out of the scope of these rules. As the definition explains, that term is only to be used in the context of groundwater remediation.

Mr. Butch Smith: Do we have any duplications? If you are getting a way of allowing, especially out in the county and you have to get a permit from the Health Department, is that coordinated together? Like I said the Health Department comes out and hears we're all digging.

Thomas Slusser: That's an interesting issue. These wells have their primary scoping authority with the state as mentioned in the Well Construction Act and in the rules that the conflict with other rules if other levels of government. I believe that those other rules supersede these rules within the jurisdictional authority of the other government agency. So we are aware that some of the county programs have a duplicate permit for systems that we permit. That has been kind of a sore issue for some people. We had some conversations with the Attorney General's office on this issue. Their opinion was that unfortunately the relevant statute both Well Construction Act and those that give the authority for the County Health Department the statutory language is not exactly clear about where the breakdown is. There's some related case law that indicates that if the counties did have requirements that were more stringent than the state rules, they would have demonstrate a need based on some unique consideration of their territory. There's no clear cut relationship of that. But in short all somebody needs technically is the state permit. Any other county permit is an issue to be resolved.

Mr. Phillips: We did make a change that does require (at least with respect to the geothermal wells) that a copy of the notification that has to be submitted in advance also goes to the local Health Department. Not to imply that they have to approve but they are at least put on notice. It's only two day's notice in the case of a residential structure but its 30 days in case of industrial.

Thomas Slusser: Currently it has been our practice for quite a while in doing permits we send a copy of the permit to the County Health Department so they can be aware of what's going on. They are a pretty good partner to work with. Sometimes they will bring some issues to us about unpermitted injection wells. They've also asked for some assistance in helping to protect septic systems and drain fields occasionally.

Upon motion by Mr. Tedder and second by Mr. Hall to approve the hearing officers' recommendation, the motion passed unanimously.

Mr. Keen: I think I can speak for the hearing officers that they left no stone unturned. The professionalism that you carried out throughout the hearings, though not well attended in all four of the hearings, your staff was set up, everything including printing was put together well. They did a very professional job.

Mr. Phillips: I'd also like to commend Thomas and staff for a lot of really good work.

Thomas Slusser: Thank you very much.

Chairman Smith: I'd like to echo that. I also want to point out that there were four public hearings held all across the state. One was in Morganton, one in Raleigh, one in Williamston, one in Castle Haynes that involved a lot of travel and I want to commend and thank, in addition to staff the three hearing officers, Mr. Keen, Mr. Phillips and Mr. Hall. Thank you all very much for undertaking this substantial piece of work.

III. Information Items

12-05 An Update on DENR's Study of Hydraulic Fracturing

<u>Summary</u> (Evan Kane): As I'm sure all of you are aware of the issue for potential development of natural gas from shale deposits in North Carolina has received a fair amount of attention in the news in the last several months, as well as some legislative interest. We were initially asked to come and give an update to this Commission about the potential EMC role in regulating the development of shale gas. The issue has not progressed to the point where we're ready to talk about the EMC's role or any specific rule changes that might be necessary in order to effectively regulate the industry, such as the question that was raised during Thomas' presentation about amending injection well rules to address hydraulic fracturing. We're just not there yet. But with the invitation on the table this is a good opportunity to come in and give you an overview of North Carolina's potential shale gas resource, a summary of the recent legislation that was passed last year, the current status of our study and some of the major environmental considerations that have risen to the top or want the most attention, as well as the current regulatory situation that pertains to those. Admittedly I'm speaking on behalf of DENR but I'm a water person, specifically a groundwater person, so my presentation will reflect that bias and I'll defer questions about other media to some other staff that may be in the room if those questions come up.

On to natural gas in North Carolina; who knew we had this? This map shows the basic geological provinces of the state from the Blue Ridge in the west, the Piedmont in the central part of the state, the coastal plain and the eastern part of the state. Blue Ridge and Piedmont are underlaid by primarily igneous and metamorphic rocks that don't have any potential to bear natural gas or hydrocarbons. The coastal plains consist of layers of sediments and sedimentary rock that have so far not show any potential for oil or natural gas development. No major recent sources there except potentially offshore out in federal regulated waters. But here in the central part of the state, the Piedmont we have these structures known as the Triassic rift basins and they are known as the Deep River Basin running here from basically Granville County and Durham area down through Wee, Montgomery and Moore Counties, and Anson County down to South Carolina, and the Dan River Basin which extends into Virginia. It actually is called the Danville Basin in Virginia.

Just a quick statement about river basins. You all are very accustomed to hearing about river basins and these are not river basins. Unfortunately, the nomenclature gets a little confused, but these are geological rift basins and they happen to be named for the rivers that flow through them. But these are not river basins.

These Triassic rift basins are basically low lying areas that were formed during the breakup of North America and Africa about 200 million years ago. As the Atlantic Ocean was being created it created cracks in the crusts and some down drop blocks of rock. As you are aware from any construction site any place you have a low lying area adjacent to a higher ground, you're going to have some erosion and sedimentation issues. These are erosion and sedimentation issues on a large scale. These rift basins were the host to freshwater lakes back during the Triassic period. Those freshwater lakes had as any freshwater lake does algae and plants in the lake sediments and subsequently buried deeply and modified various forms of hydrocarbons.

These rift basins were actually noted. If you could look at the 1823 geological map of North Carolina which was the first geological map made of any state, it actually looked almost identical to this map in that it identified three major geologic terrains. And identified here instead of Triassic rift basins it identified areas of coal deposits. These areas were actually subject around

in Lee County to exploration and production of coal in the Civil War and into the early 20th Century, and prior to the Civil War to some degree.

In the 20th Century these basins were subject to some exploration to look at the potential for the development of oil, primarily. Shown on this map we see the locations of exploration wells that were drilled throughout the 20th Century in both the Deep River Basin and Dan River Basin. The focus of a lot of that drilling activity happened in Lee County. That's kind of been identified through various explorations as the most likely target for hydrocarbons. None of these wells ever produced any oil or gas, however many showed the presence or evidence of natural gas either through the rocks ……(**recording skipped)** North Carolina Geological Survey began reevaluating some of the data that was generated from these holes. It was shown that there may be an economic resource that could be developed through the use of horizontal drilling and hydraulic fracturing. Various mapping and exploration has been done.

If we could make a vertical slice through the earth through each of these basins we would see layered sediment deposits that have been disturbed by faulting to some extent. That specific formation is host to the gas that may be economic to recover. Likewise in the Dan River Basin there's the shale sitting at depth but coming up to the surface that may be host to this natural gas.

The NCGS has done a lot of assessment work on this and they've given their data to the U.S. Geological Survey in hopes of getting a quantitative estimate of how much gas may be present in these basins over at the Nicholas Institute. The Marsellas shale underlies Pennsylvania and New York as well as the Utica shale. The Barnett shale has attracted a fair amount of attention in the news. They're around Fort Worth, Texas. Various other shale plays are being explored throughout the country. Most of these already have existing infrastructure to serve them because of prior exploration and production of hydrocarbons in these basins. However, in spite of the fact that these Triassic basins are not on the map as far as the EIA is concerned and the USGS has not been able to make them a priority.

There has been leasing activity in Lee County where folks associated with oil exploration or gas exploration companies have gone out and signed mineral leases with property owners that would give them the ability to drill on their property, and extract natural gas. That along with the attention given to this issue by the North Carolina Geological Survey has attracted some legislative interest during the last session resulting in the passing of HB 242 which just at the broadest level did a few things. It increased the bonding requirements for oil and gas drilling permits by a small margin as well as increasing the fee for permitting of oil and gas wells. It added some minimum land owner protections to the lease requirements in our Oil and Gas Act. Previously all that land owner protection had been subject to negotiations between the land owner and the leasing agent, and the state had no involvement in that. It directed DENR to study and report on the shale gas development potential and the associated impact that we might expect from that in North Carolina.

Specifically under that, the legislature directed us to address a number of issues that are within the purview of DENR. The potential for oil and gas reserves in the Triassic basins, the methods that might be used for exploration and extraction of that oil or gas, potential impacts that this activity may have on infrastructure and water resources as well as environmental impacts, and the potential oversight and administrative issues that might be associated with a regulatory program. Those are the DENR issues.

In addition the study, with cooperation from other groups outside of DENR is to address the potential economic impacts, social impacts which we've seen in other states, consumer

protection and legal issues primarily related to leasing, and require us to have at least two public hearings in the course of the study. Our deadline for doing all of this is very generous, May 1, 2012. We've had the first of the public hearings.

The study status right now is back in the summer we convened an Interdivisional Team with representation from Division of Land Resources, Air Quality, Waste Management, Water Resources and Water Quality. We developed an outline which we put out for public comment and revised based upon those public comments. We've hired the USGS to conduct a well inventory in Lee County around the areas of active leasing so that we have some information on the location and construction of water supply wells in that area, in case we needed to go in and do baseline sampling. USGS is actually working with researchers at Duke whom has done some publications on the impacts of this industry in Pennsylvania. They're looking at using this as a sort of a test environment to do some baseline sampling to compare to that previous work.

A handful of us in DENR also took a trip up to Pennsylvania to talk with local and state government, the industry and public interest groups about this industry and its impact in the area. We'll be releasing the draft of our study in March and putting that out for public comment and having two additional public meetings. One will be in Sanford on April 20th and one in Chapel Hill on April 27th to collect additional comments on our study and make sure we've addressed the issues that the public has in mind.

It's premature for me to share with you the results of the study because we haven't shared that with the public yet, but I will touch on a couple of things that have helped us identify some of the highest profile issues. The first of these is one step we took in the study which was to bring in a group called STRONGER which is acronym for the State Review of Oil and Natural Gas in state governments and public interest groups. **(recording skipped) NOTE: Portions in [brackets] are filled in for sections where the recording malfunctioned.** [STRONGER consists of representatives of industry,] state governments and public interest groups. They have developed and adopted guidelines that should be adhered to for any state regulatory program that's regulating oil and natural gas development. The guidelines are primarily focused on issues such as the management of the waste from this industry as well as how to deal with abandoned wells and some administrative issues associated with regulatory programs. At DENR's request STRONGER convened a stakeholder group that came to North Carolina and met with DENR staff to review our existing programs and existing regulations as they currently pertain to this industry. This was not a speculative exercise in how we might regulate, [but a review of our existing requirements and programs] as they pertain to the current level of activity and current practices. The report they released in February concluded that DENR has mature environmental programs and staff with significant experience in those programs and with those effective media, but not specific experience or technical criteria for regulating oil and gas exploration and production. One particular strength that they noted in their report was the fact that all the regulatory programs that affect this industry with the exception of the Radiation Protection Section all report to the same Secretary and they're all housed within the Department of Environment and Natural Resources. Their recommendations in general are fairly broad but included developing formal standards and technical criteria for dealing with the waste associated with this industry and to ensure that our state staff, the industry and the public are aware of the expectations and can focus some of their attention on the specific impacts of oil and gas development.

Moving to some of the particular environmental considerations that have been highlighted to us through all the people we've talked to and the study we've done, [well construction is a

critical issue.] [The drill rig seen here, at the time this picture was taken, was drilling at a depth of 10,000] feet and roughly half mile off of the site underground; this is not your typical water well rig. As we've seen and the example mentioned by Mr. Phillips earlier, any kind of well construction has the potential to cause disruptions of water supply and water quality. Managing the potential for those disruptions is pretty critical. In addition to the process of creating the well the way of that cement are not just as simple as backing up a cement truck to the well head and pouring it in. There are a lot of sophisticated techniques that have to be employed and regulations need to be adapted to deal with that.

Currently in North Carolina our regulations on oil and gas well construction haven't been updated in decades to reflect [modern oil and gas well construction techniques] to 7,500 ft., and then turning that drill bit off to the side **(recording missing)** [Horizontal drilling is effectively prohibited] under current regulations. under current regulations. That's not a prohibition that was adopted with hydraulic fracturing in mind. It's more a matter of protecting adjacent land owners from having the natural gas under their property taken away, as well as an old concern with the adequate casing and cementing of the well; that was intended to be vertical and didn't wind up vertical.

Water supply is an issue which has been in the news quite a bit. The picture here shows a typical water supply impoundment used in Pennsylvania several acres in size. The water use by the industry basically has two components. Hundreds of thousands of gallons would be used for the construction of any individual well just to make up drilling muds, things like that. Roughly 5 million gallons of water are used in the hydraulic fracturing of a typical well in Pennsylvania. They use raw surface water throughout Pennsylvania pretty extensively. This water withdrawal isn't a big issue if you're withdrawing water from the Susquehanna River at full flow but can be an issue in some of the remote areas where they're drawing water out of headwater streams and maybe you have multiple wells being hydraulically fractured over a period of time, drought conditions and things like that. So obviously that can create some concerns in low flow streams when you get away from these really big rivers like the Susquehanna. It's really an issue of cumulative impacts and the timing of those impacts. Once you've gathered this water, these 5 million gallons of water you've mixed it with some chemicals and you're going to place it down a well in order to crack the rock.

This is a wellhead shown during hydraulic fracturing. These are the supply lines providing the fracturing fluid to the well. There is a blowout preventer at the top to prevent fluids from spewing out if they should lose control of the well. On top is a device like an air lock that allows them to lower various tools into the well while it's under high pressure. So you put this water down the well under high pressure and you're going to get anywhere from 10%-30% of that water back so you have to have something to do with it. It comes back over a very short time period, periods of days or weeks. This is not a continuous waste stream from any given wellhead so you've got to deal with that. Direct discharge of oil and gas wastewater is not allowed under the Federal NPDES Program. So your options are to take this to a pretreatment program with a municipal wastewater treatment or a centralized wastewater treatment facility that may discharge under a municipal NPDES permit or its own NPDES permit. You can either do that or land apply it in rare instances, inject it to dispose of it which is currently prohibited in North Carolina to recycle.

[Here we see] rows of tanker trucks that are lined up to receive the flow back water from that well and then haul it off site by truck. That is one of the avenues for the truck traffic that you may have heard a lot about. In this example this is a well head where that water has gone to

a recycling facility and has been hauled back out to another site to be used as makeup water in the site. That's distributed around. You have a smaller number of tankers to provide some of the makeup water **(recording missing)** [not every company does this] but that's how one company in Pennsylvania is dealing with a lot of its wastewater. Ultimately at some point you do have a last frack job and you will have a volume of wastewater that has to be ultimately disposed of in the end.

Stormwater and spills are another issue. Right now under the Federal NPDES requirements stormwater from oil and gas expiration and production activities is exempted from Federal NPDES requirements. States generally have sediment and erosion control programs to deal with this but they may not always be sufficient we find to deal with that. But even after site stabilization you have several acres of compacted soil which may have impervious liners placed on it and you're going to be generating quite a bit of stormwater. This is during the actual well construction phase. During the hydraulic fracturing phase you still have the same well path of several acres of compacted soil generating wastewater. Even when you move into production typically the companies like to keep big accessible areas of several acres flattened out and fairly heavily compacted in case they need to come back in and do any work over or drill additional wells on the pad. Throughout each of those phases you're continuing to generate stormwater. There is the State Stormwater Program in place to help address the stormwater generation and the types of pollution that wouldn't be addressed through sediment and erosion control.

This is just for illustration purposes. Another typical drilling site that we saw in Pennsylvania, this company likes to put a 3 ft. high berm around the entire site and then put a liner over about half of the site with additional liners and berms around any materials handling areas. There may not be a single solution to any of these stormwater runoff issues. **(recording missing)**

There has been development of a national website for disclosure called FracFocus.org. That's one avenue that some states are using in acquiring the operators to submit their information to that website.

[Another challenge is the learning curve for industry and regulators] adjusting to the geography climate, the geology and even the culture of the area. Regulators who have previously not - especially in the case of Pennsylvania over the last several years dealt with this industry on a large scale are now trying to apply some old regulations to a new industry. I would just remind you about the upcoming public comment period at the end of March and the public meetings coming March 20th and March 27th in Sanford and Chapel Hill. I direct you to our website if you need more information and you are looking for updates on the study, just go to……..**(recording cuts off and skips)**

Mayor Moss: I want to note that Creedmoor has the state's first local government ordinance prohibiting fracturing or hydraulic fracturing in our community. Additionally in my role as chair of the Water Allocation Committee we have taken up the matter or the discussion of capacity use area designations. We got a briefing on that yesterday so I'm just beginning to lay the groundwork so we have a kind of a direct contradiction to what you said, Evan about EMC not having a role at this moment. We are at least getting a briefing and understanding what our role could potentially be as an EMC committee.

Evan Kane: Yes I think. I take your clarification. My comment was maybe a little overbroad.

Dr. Moreau: What's the release date on the report?

Evan Kane: We don't have a specific release date for the draft but it will be in advance of those public meetings. Next week I'm being told.

Chairman Smith: Is the first public meeting March 20th?

Evan Kane: Yes. That's in Sanford at the Wicker Center at 6:30 p.m.

Mr. Martin: I just have one question. Everything I've been hearing about and getting calls about concentrating on Lee and maybe a little bit in Chatham, I'm just curious why are you not hearing more about the northern counties in North Carolina as far as this potential? Is there just no data or is there data and there's nothing there? Do you have any idea?

Evan Kane: I'd really have to speculate and let the state geological survey address that question. What I do know is that the most recent data that was generated was two wells were drilled adjacent to the Deep River in Lee County in 1997. I don't think any drilling has occurred.

Mr. Martin: (tape skipped the beginning of this part) Referring into the other Triassic Basin or Mr. Moss' area like Granville and even Wake and Durham…… **(recording skips)**

Evan Kane: That I can speak to. In terms of the geology the thickest of the shale deposits are down toward Lee County. Essentially that's where you had the deepest lake when these were active lakes. As you have with any lake you have streams feeding into it that start off small and get bigger and flatter and more stagnant. You collect more organic material in the stagnant portions and down in the lake itself. Whereas, if you get to the margins of the basin and the northern end of the Deep River Basin you [don't] have the right geological conditions to create the hydrocarbons in the first place in some of those areas.

Mr. Tedder: I haven't heard a whole lot about the Dan portion that you had on your slides. Is that just because of much less potential? The reason that I'm asking that is that I see the location of your public meetings and obviously there's nothing in that area.

Evan Kane: I don't want to speculate on the quality or the quantity of the resource. I think that would be best addressed by the [state geological survey.] There may very well be more or less gas in the Dan River Triassic basin but currently the most data is coming out of the Lee County area.

Dr. Larkin: What's the relationship between the terms hydraulic fracturing and horizontal drilling?

Evan Kane: Horizontal drilling is just the process of controlling the orientation of your drilling as you go. The drillers typically drill down vertically to a kickoff point and then they change over by controlling that drill head through these hydraulic motors so they can control the orientation of the hole as it progresses, and gradually bring those rods around where they are

drilling flat through the sub surface. Once you have completed that drilling and case the well in all those layers of casing and cement, then there's a separate process to actually take the drill rig that you saw, dismantle it and move it and create some artificial porosity in the rock.

Dr. Larkin: Is it the horizontal orientation because of the orientation of the shale? Is that why that's advantageous?

Evan Kane: Yes. They're primarily drilling horizontally but they actually have the ability as that shale layer [undulates] they have the ability to steer the drill bit through that shell. **(recording missing)**

There was another question about whether our study is looking at the full life cycle of economic impact after production. We're looking at essentially the full life cycle of development here, not just the drilling and the fracturing but what happens as you move into production and things like that, at what economic impacts it has throughout that process.

12-06 Mercury TMDL Update

Kathy Stecker: Good afternoon. I just have this one slide so it might not be fifteen minutes. This just shows our current plan from moving forward with the mercury total maximum daily load or TMDL. We're still finishing up the draft permitting strategies for water and air, and they are separate from all three documents for initial informal public review in early April. At that time we will also announce the location and times of stakeholder meetings in late April and we'll ask for feedback from stakeholders to help us prepare materials for the meetings. In late April we will also begin the formal public review and comment period for the TMDL itself. We can come back to you in May to let you know what kinds of comments we're receiving. Then we'll compile and consider all of the suggestions we get and make revisions to the documents accordingly. In June we'll prepare the TMDL and our responses to those comments. You'll recall that EPA must approve or disapprove TMDLs but EPA does not take action on implementation plans. So the permitting plans will not be part of the package submitted to EPA. That's really all I have. Thank you. I can take your questions.

(**recording missing**)

(**audio problem**)

Cam McNutt: In 2011 you saw presentations from Kathy Stecker, myself and Jay Sauber on the assessment methods through 303d listing, some of the Clean Water Act issues including TMDLs during paired determinations greater than 10% exceedance of the standard or fair severe or poor and that's usually based on the worst assessment. So for an example if you have three category 1 assessments that are supporting and one category 5 assessments that's impaired then the water body itself would be considered impaired and placed on the 303d list. Also there are waters that are impaired in category 4 but do not require a TMDL. Those are not on the 303d list that's out for public review.

You probably have seen this if you've looked on the internet; this is a copy out of what's actually out there for public review just too kind of orient you to what the public is looking at. Again these are category 5 assessments for these parameters so the overall category is category 5. There may be other supporting assessments for this but only the published category 5

impaired assessments are showing up here. It includes stream name, description, how large it is and the units that we're measuring. Up here in the tiny red is where it says that all the North Carolina waters are currently impaired and in category 5 because of the fish consumption advised for mercury. So we don't publish the list of all 13,000 of those. We just say at the top of each page in the review process. After we released the draft category 5 or 303d list last month right after that we also released some supplemental information to help assist in the review process. That included a document similar to what you saw on the last slide except it also included the category 4 impaired waters, so basically a listing of all the impaired waters; not just the ones requiring the TMDL.

We also provided a list by county to basically assist people in finding impaired waters that are in your county instead of organized by the sub basin watershed, sub watershed which basically requires you to have a pretty good knowledge of where you are watershed wise and state, so we did provide it by county. We've also provided a GIS to help in mapping and local governments like to use this because it helps them really speed up their process especially municipalities counties looking at where these waters are coming into and out of their jurisdictions. We've also been addressing daily emails and phone calls from the public and others to help and assist them in reviewing this list as well. All of this information is available on the website here and we still have a few more days left in the public comment period. I think it ends Monday night.

Here's an overview of the four different types of water bodies that we assess in the state. These are percentages of the monitored waters so these pie charts do not represent unmonitored waters. The Atlantic coastline, which is basically the beachfront of the Atlantic Ocean, a 100% of those waters are supporting and we monitor about 90% of those. We're still rectifying some issues with locations of some of the monitoring stations so again these are draft and these pie charts would change a little bit once we finalize after the public review and comment. The supporting assessments are in the blue pies here. Those are water bodies that do not have any impairments so all the assessments on those water bodies are supporting whatever the uses are. The grey areas are ones where we have data and information but it's not conclusive enough for us to determine whether it's supporting or impaired. The pink pies, the smaller ones are impaired water bodies that do not require TMDL as category 4 waters, and the red pieces of the pies which are 27% for reservoirs, 53% for estuaries and 24% for rivers and streams. Those are the waters that are impaired in category 5. Those are the ones that would require a TMDL. For each of the water body types we monitor about 60% of the reservoirs and lakes in the state so this represents that 60%. We monitor somewhere around 75% of the estuarian waters and for rivers and streams by the number of water bodies, we only monitor about 15-20% of those across the state. So there are a large number of waters that we do not monitor such as rivers and streams.

This breaks it down a little bit differently. These are numbers of assessments that were made and these are the parameters for those assessments. So this represents a count of roughly 570 or so estuarian water bodies that have non approved growing areas for shellfish harvesting. That's the number one impaired assessment that we see across the state. The second highest ones are these 300 or so biological integrity impairments and those include both benthos community impaired as well as fish communities. Some of those streams may have both of those. They're not double counted here. We're just taking it by the number of streams. The next highest one or turbidity which is aquatic life use standing and we have just over 110 or so of

those that are currently impaired, and that again is category 4 and 5, then bacteria which include the beach monitoring as well as inland fecal coliform monitoring as well.

From the pie charts on the previous page in the rivers and streams the biological integrity impairments and the turbidity impairments make up the bulk of what you saw as the red pieces of pie on those. For the estuarian waters the overwhelming majority of that 53% of impairment was due to non approved growing areas. But there's also included in that some of the large estuarian areas of the Neuse River, Tar-Pamlico and the Cape Fear River which are impaired for dissolved oxygen and chlorophyll-a as well.

Just to give you some of the highlights when we compared all those parameters that you saw in that last slide we looked at the net difference between the 2010 assessment and the 2012 assessment and these were the four parameters where we saw kind of the biggest change. There were changes in a lot of the other parameters. There are about 40 parameters in all that were assessed. Most of those changed by maybe one or two water bodies either becoming impaired or not impaired any more.

These were the four largest ones that stood out so I thought I'd spend a little time explaining what was going on with these. Four of this chlorophyll-a impairments were not assessed as impaired in 2010 because we had insufficient data to make that impairment. In 2012 we had collected more data and therefore we had enough data to say that they were impaired for aquatic life use due to chlorophyll-a exceedances. Two others of those had just slightly more exceedances than they did in 2010 that would cause them to become impaired, and one of those was because of a new station that had been established. We had not previously been monitoring that before. For the fecal coliform difference we had a net increase of 18 and don't mean that we necessarily had 18 new water bodies that were placed into the impaired categories. It just means that we have 18 more than we did last time. There's a give and take of several of the impairments that could no longer be impaired and then new ones that come on. Most of these are from extensive new sampling that we did in the western part of the states, so that fecal coliform monitoring was going on as part of the source tracking project to determine where the actual problems were coming from. I think it is in four different pretty small watersheds but they did a lot of intensive sampling. So basically, 18 new streams were placed on the impaired waters list due to that.

The turbidity increases about 90% of these new turbidity increases are due to what we kind of call the tick tock effect where this time around we had two more samples that were exceeding, and the last time we had two less that were exceeding. So they're hovering right around that 10% exceedance criteria. Every two years you look at that. One water body may be impaired and the next time it's not impaired, so it could go back and forth. Ninety percent of these were in that area where we dropped off two years and added two new years and within that two year area we had slightly more exceedances. But again they wouldn't be called significant changes in water quality. When we see a larger number of changes for any given water body increase in the interior cocci impairments this is only in the coastal areas, the salt water areas, and this is involved in recreation. Some of those are from actual decreases in the number of exceedances that we have but also a change in how the geometric mean was calculated, which is one of our more complicated assessment methods. We're still working with the Recreational Monitoring Program on the coast to make sure that we're doing this assessment in a uniform way or the same way that they do, at least a similar way but not exactly the same.

We often are asked and we've been asked probably today is water quality better or worse than it was in 2010? The 303d process is really not the right tool to answer this question.

(audio skipped) One of the other reason that I've just explained for turbidity is data noise where you have one or two more samples and then a few less samples as you remove the two years prior, and then add another two years of data. Also it could depend on whether or not those two years were rainy or the preceding years that you dropped out of the dataset were dry.

There are also changes in methods, standards and guidance that are involved in this process. In 2002 we changed how we assess the shellfish harvesting use which basically added a lot more waters, although the water quality didn't change, just the process changed. In 2004 we changed how we were assessing turbidity and most recently in 2008 with the change in how we were assessing some of the metals. So if you were to compare from cycle to cycle to cycle over that two year period you could perceive some changes that aren't really water quality changes. It's changing methodology. That is part of that kind of perceived to your baseline only looking back two years from the time before you're not allowing for much time to actually have change happen other than potentially high hurricane years, wet years and dry years. You're not really looking over a long period of time to see if changes are actually in water quality or whether new year logic or the data noise.

We had 18 new impairments, fecal coliform, all those were because we had more data and that happens regularly, especially as we have more local governments getting involved in collecting data and submitting it for these assessment purposes. One of the other things and we're still toying with this but a lot of our monitoring goes on in pretty big water and a lot of our implementation goes on at very small scale. So if someone is implementing a small BMP in a parking lot that's 14 miles upstream at one of our stations, it would be very difficult for us to see it changing water quality, unless there were massive amounts of restoration done in that two year period, which we all know that's not happening. So what we can do we can look at some of our long term stations to see changes over long periods of time for certain parameters and we have some stations that go back even further than this. But this is basically forty year look at turbidity in the coastal plains, mountains and piedmont. This is available in the State of the Environment Report. You might have seen this already; you can get that from the DENR homepage but here is the website right here if you want to look at it.

These huge decreases that you're seeing right here prior to the 90's are likely due to changes in agricultural and development practice. Then we see some slight increases here in the mountains again due to development and population change. We've had a huge increase in population through the late 90s into the last four or five years. We've seen these kind of flatten out as far as trends go. Again these are long term datasets and something that you can look at for the big picture. But if you go stream to stream on a very small scale you might see something completely different where one road crossing, the stream is very good shape because nothing has happened there. The next road crossing the stream could be completely destroyed. So we can't necessarily take these trends to indicate that everything is just fine. We still encourage people to go look at their local streams if they want to see if things are changing in those areas.

Our next steps we are on target to complete the public review process next week. We're already in the process of making changes and corrections based on internal review, sorting out some of the issues we had identified during the assessment, and also getting information from the public as well. We plan to submit the category 5 or the 303d list to EPA April 1st. After approval which we hope will be rapid, we'll take another look at our methods, guidance and standards to see, if we need to make any adjustments prior to the next assessment which will start in 2013 timeframe, and be back again in 2014 with the next report. With that I will take any questions you may have.

Chairman Smith: Questions or comments?

Mr. Smith: Once again you're talking about North Carolina we're not supposed to eat fish because of mercury? Did you say that?

Cam McNutt: Well the advice is for women of childbearing age and small children so I guess we would be ok to eat some of the fish.

Mr. Smith: The reason I asked the first of week in April is trout season. But are they discovering in the lake's mercury or discovering in the rivers or do we have enough data saying the lakes have more than the rivers? Or where is the mercury actually coming from? Because I know we discussed with ash on the coast.

Cam McNutt: Atmospheric deposition is likely the major source. How it behaves in the environment can be regional depending on the water body types. The first advisories that we had for mercury were in the eastern part of the state where the conditions and the ecology of the fishes were more likely to accumulate the mercury in the fishes. We've seen it in predatory fish across the state where they had elevated mercury.

Mr. Smith: So I can trout fish next month?

Cam McNutt: I would guide you to trout fish and use your own judgment on what to eat and how much.

Mr. Ellis: The mercury issue in fish has been going on for quite some time. If you will take a look at the advisory it's pointed out for women of child bearing age and also young children. It's for the top order predators such as the largemouth bass, black fish, chain pickerel as well as some salt water species. One of the concerns we have is that fish is a good thing to eat. It's good for you and a lot of the information has gotten out there just has people scared to death. This is one of the things when I was working for the Department of Agriculture I was involved with because we want people to eat fish; we want people to interact with the natural environment, go trout fishing, go catch bream, these kinds of activities are fine. But just when it comes to a certain few species of fish, if you have young children or are a women of child bearing age, don't eat it. But you can still have fun and enjoy fish.

Dr. Peterson: I'm curious about one thing. You mentioned that in the estuaries the cause of impairment was dominantly fecal coliform. My question is this. That is essentially human health standard that we have in water quality, do the biotic data which are the state of the fish and benthic vertebrates from estuarian waters indicate biotic impairments if you just use that alone? Or is the biotic system essentially healthy and it's the human health issues that are the major determinant of what we are deciding as through the 303d list waters there?

Cam McNutt: It's mostly the shellfish harvesting which are related to the fecal coliform, the human health. We do not have extensive monitoring of aquatic life like out in the middle of the sounds necessarily, and the monitoring that we do is mostly ambient in nature. We're not doing

direct monitoring, fish communities and benthos in the estuarian environment. The impairments for aquatic, the chlorophyll-a exceedances is in the high ph in some cases.

Dr. Peterson: So why do we blow off the ecosystem in the estuaries? So we put all this effort into these guys that catch trout in the mountains. What about us at our fish communities and benthic communities? Is that not part of the regular program?

Cam McNutt: We haven't developed the criteria to do those assessments. It's a pretty dynamic environment so I'm sure you'll be on board with looking into that in the future.

Mr. Tedder: Just a quick question. I think normally whatever I put you on the list; take them off the list you got to use the same date. Is that correct?

Cam McNutt: Yes.

Mr. Tedder: Can values in fish in a certain area or take it off?

Cam McNutt: Right now our criteria are the actual fish consumption advice, the methodology for it being on the list as if fish consumption advice, not the actual tissue. The advice is based on the tissue data but our methodology is.

Mr. Tedder: That's what it is, advice to stop saying it's necessarily that it's impaired or there's a problem or necessarily a problem. If one ask you to go back and look at the data, a huge amount of it was either out of state data is being used for that assessment. I think it's a logical question about the statewide mercury, posting 13,000 miles of streams impaired. But I hope we will be talking about that in water quality and upcoming meetings.

Ms. Deerhake: So you said 13,000 miles streams.

Cam McNutt: 13,000 water bodies. The mileage if you counted the mileage it would be over 40,000 plus a million acres of estuary and two hundred something thousand reservoir acreages. I just do the counts to normalize it and make it easy to look at.

Ms. Deerhake: This isn't any comment on the state per se. It's the entire design of the TMDL 303d listing program, but my impression over the years as it's been an effort to get them listed but assuring the full implementation and restoration of these streams is not pursued as strongly or as effective by EPA. I guess it could trickle down to the states too. My comment and my question is why can't the state take an approach where we develop a true strategy that's based on these impairments. A strategy for restoration in which we look at the listings, not only going through; for example, the chlorophyll-a review that we're doing right now, but perhaps prioritizing these listings with respect to either their sensitivities or proximity to state and federal lands, various types of exposures to the public and ecosystem protection, prioritizing those and come up with a real strategy of how to address and execute restoration?

Mr. Tedder: In response to why do we not become more involved in that? All I'm going to do is just quote it and you can read it, 143b 283c tells you to do that. I pulled the Broad River Basin

just for an example to look at the fish data that was available and it was actually available for like five sites of the entire basin. I think there were like 35 samples that exceeded like the .4 or .3. Thirty of them came from one water body but yet the entire basin posted. That tells me there's a flaw in the system.

12-08 Groundwater Monitoring at Power Plants with Coal Ash Ponds

Summary (Ted Bush): As a result of EPA's consideration of regulations coal combustion products under RECRA in 2000,we did have a series of discussions with both Progress Energy and Duke Energy. They both implemented voluntary groundwater monitoring around 2006. Then to follow up with that in December of 2009 we asked that both the utility companies place wells at the compliance boundary so that determinations could be made as to the level of compliance at the facilities.

For a quick review with respect to the compliance boundary definitions that are indicated in your rules at 2L .0107 application area or 50 ft. inside the compliance boundary, whichever is closer to the waste application area. As I pointed out those are in your regulations that 2L .0107 with the particular facilities that we're talking about, the coal ash facility there are number of factors other than just those portions of the requirements that are being taken into consideration. That is things like the type of permitted activity. The fact that these are facilities that have been applying, that have been using these area impacts, these facilities generally have fairly large sites. We're talking about not small sites but fairly large sites and there is quite a bit of area that we're talking about and looking at the potential for impacts.

With respect to the wells and where they're located, the construction of the majority of those wells was completed by December of 2010. Due to the required distances from waste area groundwater modeling was required for some of those wells because the compliance boundaries extended out into multiple waste disposal areas, ash storage areas here, and ash ponds here. The compliance boundary which is the green line is located around those facilities as I pointed out earlier at a distance of 250 ft. or 50 ft. inside the compliance boundary depending on which is closer.

Looking a little more closely at that same image for the majority of the wells that have been put in place, they are located as indicated here along, on the compliance boundary. However, some of the wells as is here with MW 13 there is a water body that passes close to that area prior to reaching the compliance boundary. For those situations these three wells, MW 11, MW 15 and MW 14, those are ok. They can be located but for a situation where that well indicates with MW 13 has to be located some distance away from the compliance boundary. The requirement has been that the monitoring occurs here at the well location and then there be a mathematical determination of what the anticipated concentration would be some distance away at the actual compliance boundary.

Looking at the parameters that are being monitored, they are monitoring the parameters as are indicated here. Aluminum has an asterisk because not all the facilities are required to monitor for aluminum but based upon observation in the data aluminum was added into some of the requirements for some of the facilities because there was some observations for potential concerns there, just because of their aluminum concentrations.

We began to receive sampling data in January of last year which is a little over a year ago. In March DWQ and the utility companies met to talk about next steps if exceedances are consistent based upon that monitoring information. Both utility companies have completed 2-4 sets of

groundwater sampling. I think when I was here last time that was one to 1-3 sets. We have gotten in additional information and are reviewing that as a part of the ongoing processes and looking at the exceedances that are being observed, largely, as the chairman pointed out mostly metals but some of the other constituents as are indicated in the list here. We'll talk a little more specifically about some of those in a moment.

One of the clarifications that is certainly appropriate at this point is to make the distinction between groundwater exceedances and groundwater violations. Exceedances occur when the concentration of the substance exceeds the groundwater standards. But either it's at or below the naturally occurring concentration, or it occurs inside of a compliance boundary as it was indicated on the area photo that I just showed you. Groundwater violations on the other hand are when the concentration of any substance exceeds the groundwater standard and it's not naturally occurring or it exceeds the naturally occurring concentrations, and it occurs at or beyond a compliance boundary or there is no compliance boundary in existence.

Looking at some of the specifics at the data and looking, this graph illustrates based upon the number of facilities, there are a total of 14 facilities that we're talking about. Looking at some of the bars which indicate exceedances that have occurred at some number of facilities, in this case the most common is iron manganese and ph that has occurred at all 14 of the facilities. The other exceedances are indicated here as for TDS, 8 facilities sulfate chromium as appeared at 7 different facilities, etc. Looking at that same data just on a little bit different basis, based upon the actual 137 total wells that are being monitored, you see the tallest three bars. Still we're talking about the same parameters, iron, manganese and ph being the most prevalent exceedances that are being observed, the others as are indicated here based on the number of wells where those particular exceedances occurred. When you look at that same data again looking at it on the basis of those occurrences above 2L which is in the yellow or below 2L which is in the green, again you see the most prevalent areas where there are exceedances above 2L or with iron, manganese and ph. The other parameters are to a lesser extent, significantly less extent than those particular three parameters.

Overall when you take a look at the 8,758 analyses that are being run as a part of this process we're seeing a percentage of about 10%. When exceedances are reported APS staff requires that we take a look at naturally occurring concentrations. We look at whether or not the particular constituent that's occurred is a natural constituent or one that occurs in nature. We look at the validity of the sample results. Are there other factors as a part of the sample collection process, for example that could have affected the outcome? In the case of those situations where the sample was collected some distance away from the actual compliance boundary, we're taking a look at the groundwater modeling data providing some level of analysis as to production information seems like it could have had an impact on the outcome. But taking a look at all of those items would be a part of the analysis that would be done once the data is received.

Looking to keep this in perspective to some extent if you actually look at data that this chart indicates data that was collected from private individual homes, supply wells as a part of and was reported as a part of the DENR North Carolina State of the Environment Report 2011. These I would point out would be samplings that would be typically not necessarily adjacent to an ash pond nitrate ph, arsenic, chromium, iron and manganese and with all of them between 4 and 5,000 samples that have been collected. You again see a similar trend is what I indicated a minute ago with the power plants. That is that with ph, iron and manganese the concentrations of exceedances of groundwater standards are again the three highest that are observed, indicates

that ph 18.4%, in the case of iron 57% are in fact violations. If they are violations and are confirmed as such then actions will need to be taken in accordance with your regulations. So those discussions are ongoing with staff and our regional offices, with staff both Progress Energy and Duke Energy as well. That basically summarizes the information that we have received so far.

Jeff Morse: Those exceedances that you found in the residential samples that mirror the industrial ash areas, are those from just natural? What's causing those exceedances? Is it natural conditions or either exposures to some kind of contaminations?

Ted Bush: All of those parameters are naturally occurring parameters. I don't have any information at this point that would suggest that the occurrences that were observed were for causes other than natural causes, however that could be the case obviously, and we just don't have that information available to us. But generally speaking those samples would be collected at a distance that would not typically be in the middle of something that would be considered to be a contamination type of concern from a groundwater perspective.

IV. Status Reports by EMC Committee Chairmen

A. Water Allocation Committee Mayor Darryl Moss, Chairman

We had one item on our agenda yesterday. As I mentioned earlier we got a briefing from Tom Fransen on the capacity use area designation. He gave us an update. Basically the history of the act talking about the role of the authority or role of the EMC, the process we would go through and then gave an example of the CCPCUA. Use that as an example.

B. Water Quality Committee Dr. Larkin, Reporting

We had two agenda items. The first was a request to proceed to the EMC so you'll see it in a couple of months, with the proposed reclassification of two segments of Maiden Creek and two segments of Allen Creek in Catawba and Lincoln Counties. The Town of Maiden requested these changes. They're moving from WS-II to WS-IV classification because they're not using and don't plan to use the streams for water supply. We did approve that with some discussion about what was really the appropriate classification and you will see that in a couple of months. The second item was a request to approve agriculture nutrient tracking accounting methods for the Falls Lake watershed. The Falls Lake agriculture rule establishes reduction goals for nitrogen and phosphorous and also establishes a Watershed Oversight Committee to develop the methods of accounting to evaluate the progress on those goals. The methods need Water Quality Committee approval which they go yesterday. The nitrogen is a so called in lieu nitrogen loss estimation worksheet which has been used in the Neuse River Basin and other mainly estuarian areas. For phosphorous it's considerably more complicated and I would refer you to John Huisman if you want to know any details about the phosphorous. The point was made in the discussion that these are mostly indirect measurements rather than direct measurements that's in the surface water bodies. But that's sort of where we are. Finally we did miss our chair. I'm sure we would all have been much better educated had he been there. In addition we would probably have been able to use that extra half hour of our committee meeting that we didn't get to use but maybe next time.

The Groundwater did not meet.

C. Air Quality Committee Marion Deerhake, Chairman

We had two concepts. The first one was an update on the arsenic acceptable ambient level rule. This is for breathing the arsenic not drinking it. EPA has not had a lot of activity on inhalation exposure at risk for arsenic so the SAB pretty much worked with the literature that they could work with and the support of the Division of the Air Quality. As a result they've come back with a recommendation and this concept for reducing the stringency of the AAL is before the committee. It will be drafted as a proposed rule and brought back to the Air Quality Committee for consideration, and then ultimately come to the EMC. This is not the usual ambient level concentration. We also had a concept on the revising the general conformity determination rule to update outdated federal cross references and we had a draft rule that we voted on which was just simply clarifying who falls under a permit exemption for the rule 2Q .0102. It was to clarify that some of these very small emission sources are truly exempt. Then it followed with some information items. We had a very good presentation on the state's Ambient Monitoring Program by Donnie Redmond of the staff as well and EPA finalized is in effect until some additional legal procedures are settled on that. We had a very brief update of additional Science Advisory Board activities and we thank Mr. Abraczinskas for substituting for Ms. Holman who is out this week.

The Steering Committee did not meet.

D. NPDES Committee Dr. David Moreau, Chairman

The NPDES Committee met to consider a request for a clarification of the decision we made to Superior Court to challenge the decision that the NPDES Committee had made. We were advised by Counsel that preempted our jurisdiction in the matter. After hearing testimony from the attorneys representing the parties, if I've misstated that, Counsel can correct me on it.

E. Renewable Energy Committee Dr. Charles H. Peterson, Reporting
(Audio problem)

II. Concluding Remarks

Mr. Tedder: I've got some more requests. Will the draft TMDL be coming back to the Commission? Once we can actually see something at the May meeting ready for discussion. I say it because we got basically got 13 years to do a TMDL. So it shouldn't be that big of a rush that they can't bring it back. When it comes back we will have something to look at.

The meeting adjourned at 2:00 p.m.

NOTE: Attachments are on file in the Division of Water Quality with the Official Minutes.

Lois C. Thomas, Recording Clerk

By Commission Members
By Directors
By Counsel
By Chairman

Adjournment AG03-08-12