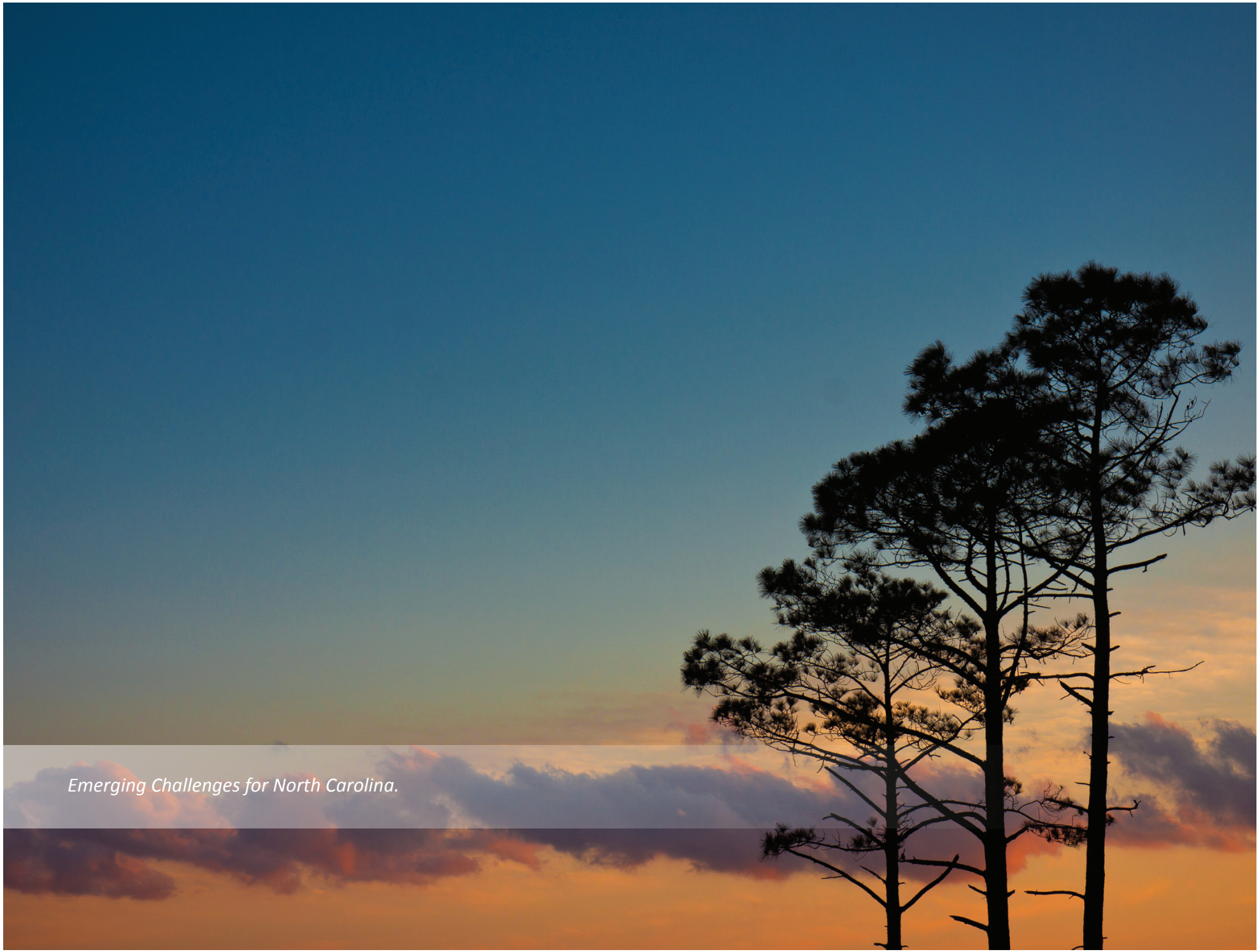

Emerging Challenges for North Carolina.

Emerging Challenges

Changing Federal Air Quality Standards. The Clean Air Act mandates that EPA evaluate each health-based air quality standard every five years to determine if the standard is adequate to protect public health and the environment. EPA has often failed to meet the five-year review requirement, resulting in court-ordered deadlines to review several standards. The agency is now more consistently meeting the five-year deadlines. Collectively, these changing standards represent the most significant emerging issue for DAQ in the coming years because of the resources required to implement the new standards at the state level. The standard changes (described in more detail above) include:

- A new 8-hour ozone standard. The next step will be designation of non-attainment areas for regions not meeting the standard. Once the designations are done, DAQ must work with local governments in the non-attainment areas to develop plans to bring those areas into compliance with the standard. The challenge for North Carolina will be to identify cost-effective emissions reductions to achieve the lower ozone standards, given all the efforts already made to reduce ozone emissions. EPA is scheduled to review the ozone standard again in 2013 and the health data supports a lower standard than the 2008 level.
- A new 24-hour standard for fine particle pollution (PM 2.5) that the EPA adopted in 2006. No areas in North Carolina currently exceed the daily standard. Several counties previously violated the annual PM 2.5 standard adopted in 1997; those counties now comply with the annual standard and DAQ has been working to have the counties redesignated as in attainment. EPA has not yet redesignated those areas; once that happens, DAQ will need to develop plans to ensure that these continue to meet or maintain the standard. EPA is due to review the PM 2.5 standard by 2011, but does not expect to issue a new standard until 2012. Similarly to ozone, the health data suggests that the PM 2.5 standard should be lowered, but it will be a challenge to find additional emission reductions.
- A new 1-hour standard for sulfur dioxide that EPA adopted in 2010. DAQ's air monitor in New Hanover County has shown levels violating the new SO2 standard and the EPA is expected to designate portions of the area non-attainment in 2012. If that designation occurs, DAQ must work with local governments to develop a plan for bringing the area into compliance. In addition, DAQ must work with large SO2 sources across the state to ensure that their emissions are not causing localized violations of the standard.
- A new more stringent nitrogen dioxide standard that the EPA adopted in 2010. This new standard presents some permitting challenges for new and modified sources given the stringency and the short term nature (1-hour) of the new standard. In addition, DAQ must develop a new monitoring network for NO2 emissions.
- The EPA recently proposed a new regulation that, if adopted, would establish technologies required for controlling toxic air emissions from industrial boilers. DAQ would be charged with implementing this regulation through the permitting process for facilities that emit hazardous air pollutants above certain minimum levels.

Shale Gas. DENR is evaluating the potential of natural gas resources in North Carolina. The department's N.C. Geological Survey has concluded that a commercially viable reserve of natural gas may underlie parts of the Triassic basins of North Carolina. Technically recoverable gas is thought to exist in the Sanford sub-basin (including Lee, Chatham and Moore Counties) and possibly the Dan River Basin (including Stokes and Rockingham Counties). A number of factors, including increased interest in non-conventional energy sources, access to existing natural gas pipelines in the area, and energy demand from nearby industries and utilities could make this potential reserve a target for exploration and development. As directed in Session Law 2011-276, DENR is leading a state study to identify issues associated with oil and gas exploration in the state. The study will specifically focus on the use of horizontal drilling and hydraulic fracturing to extract shale gas. The potential exists to develop more energy resources but it must be done in a manner that balances energy needs with the protection of public health and the preservation of the environment.

Water Supply. Although North Carolina has historically been a water-rich state, many areas of the state have felt the impact of drought in recent years. Some parts of the state experienced severe drought in 2002 and 2007; conservation measures imposed in response to those droughts affected agriculture, industry and residential water users. Since 2007, the General Assembly acted to require water systems to develop more effective water shortage response plans and to give the state a more active role in managing drought response.

Although the state as a whole has had very stable drinking water supplies, the most easily tapped water sources are not always located in the same river basin as urban areas experiencing rapid growth and increasing water demand. That has led to conflict in recent years over the practice of piping water from one river basin to another and legislative action to make "interbasin transfer" approvals more difficult to obtain.

The General Assembly has also wrestled with the issue of water allocation. North Carolina continues to be one of only two states without a water withdrawal permitting system for most of the state. (The department only issues withdrawal permits in a 15-county area of the central coastal plain where deep aquifers became depleted due to overuse; in that area, state permits are needed for large groundwater withdrawals from the affected aquifers.) As the state's population has grown and competition for water resources increased, the state has begun to focus more attention on water supply planning and allocation. A 2009 report commissioned by the General Assembly recommended development of a statewide permitting system for large water withdrawals. The legislature has not acted on that recommendation, but has taken a series of more modest action. Most recently, the General Assembly directed the department to continue work on development of hydrologic models for all of the state's river basins as a planning tool for future water supply decisions.

Coal Ash. A final emerging issue that has affected several DENR divisions is the need to store and monitor coal combustion residuals, or CCRs. Coal combustion residuals are wastes generated by coal-fired electric power plants. CCRs consist of the following types of waste:

- Fly Ash (silty)
- Bottom Ash (sandy)
- Boiler Slag (rock-like)
- Flue Gas Desulphurization residuals (gypsum)

Within the last decade, power plants have been converting their air quality controls to accommodate changing federal and state laws. In the future, DENR anticipates that there will be fewer coal-fired power plants in the state, but there will continue to be large amounts of dry CCRs. While markets exist for some of these waste products, ultimately, a larger amount of ash will have to be transported to landfills.

This poses a challenge to the state due to a continuing need for landfill space for this type of industrial waste disposal and the associated environmental hazards. Environmental concerns from CCRs pertain to pollution from impoundments and landfills leaching into groundwater and structural failures of impoundments, like the one that occurred in 2008 at the Tennessee Valley Authority's plant in Kingston, Tennessee. TVA's Kingston spill of coal combustion residuals flooded more than 300 acres of land, damaging homes and property. The released materials flowed into the Emory and Clinch Rivers, filling large areas of the rivers and resulting in fish kills.

In the past, much of the ash produced was 'wet' and ended up in surface impoundments (coal ash ponds). After the CCR release in Tennessee, the N.C. Division of Land Resources has conducted inspections of all existing coal ash impoundments in North Carolina. The state inspectors determined there are no problems threatening the immediate safety of the impoundments. In addition, many existing National Pollution Discharge Elimination System (NPDES) permits did not require groundwater monitoring around the coal ash ponds. Since the public concern after the Tennessee catastrophe, the N.C. Division of Water Quality (DWQ) has been meeting with the utility companies to take more proactive steps in determining if these surface impoundments have affected groundwater quality.

State utility companies are working with DWQ to put monitoring wells around every active ash pond and some inactive ash ponds for NPDES permitted facilities to determine if groundwater exceedances exist due to the impoundments of ash. These monitoring wells were approved and in place by May 2011. Since May, both utility companies have completed one to three sets of groundwater sampling for each facility, and they continue to work with DWQ staff to determine if exceedances reported are naturally occurring or if corrective actions will be required.

Another DENR agency, the N.C. Division of Waste Management (DWM), regulates coal ash as a solid waste. Generators of dry CCRs are required by state law to obtain a permit from the N.C. Division of Waste Management before operating a landfill to dispose of dry CCRs. Generators of CCRs are also required to notify the division if they intend to reuse dry CCRs as a structural fill, a term used to describe a building pad, parking lot or a foundation

for a structure. DENR's solid waste industrial landfill regulations have been in place since the early 1980s and have been updated several times. Eight landfills in North Carolina accept CCRs. Two additional CCR landfills have been proposed. Existing CCR landfills will continue to expand in size. Today, all CCR landfills are lined and include a leachate control system. Monitoring of groundwater is accomplished through use of groundwater monitoring wells and (liner) leak detection systems at the bottom of the ash landfill.

Climate Change refers to changes in temperatures, precipitation, sea levels and other environmental conditions due to emissions of carbon dioxide (CO2) and other greenhouse gases and particles. Scientific measurements have documented a substantial increase in CO2 levels in the atmosphere since the mid-1800s, coinciding with increased industrial development in much of the world. CO2 and other greenhouse gases (GHGs), such as water vapor, methane, nitrous oxide, black carbon and fluorocarbons, can trap heat in the atmosphere by reflecting radiated heat back toward the Earth. Even small increases in temperatures could cause major changes such as disruption of normal growing conditions for food crops, melting of polar icecaps, rising sea levels and flooding of coastal lands, changes in ocean currents, and more frequent and stronger storms.

A 2007 Supreme Court decision holding that GHGs are air pollutants covered by the Clean Air Act set in motion a number of EPA actions leading to permitting of GHG emissions. In response to the court ruling and lawsuits filed by environmental groups, the EPA issued GHG emissions standards for motor vehicles in June 2010. Also in 2010, EPA required Title V facilities – the largest stationary sources – to start reporting their annual emissions of CO2 and other GHGs. Effective Jan. 2, 2011, federal rules require permits for facilities that have the potential to emit more than 100,000 tons of greenhouse gases per year.

Acknowledgments

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Tad Boggs
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Ethan Brown
Sergei Chernikov
Bill Crowell
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Anne Deaton
Reginald Jordan
Martin Kane
Diana Kees
David Knight
Doug Lewis
Ellen Lorscheider
Jeff Manning
Tom Mather
Chonticha McDaniel
Edythe McKinney
Scott Mouw
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Linda Pearsall
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Don Rayno
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Kenneth Taylor
Michele Walker
Debra Watts
Brandon Whitesell
Julie Woosley
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