

## **Revised Outline of the Oil and Gas Study Under Session Law 2011-276<sup>1</sup>**

### **Executive Summary**

#### **Section 1 – Potential Oil and Gas Resources**

- A. Overview of the Triassic basins
  - Sanford sub-basin of the Deep River Basin
  - Dan River Basin
  - Durham and Wadesboro sub-basins of the Deep River Basin
  - Buried Coastal Plain basins
- B. Estimates of technically recoverable gas
  - Sanford sub-basin
  - Dan River Basin
  - Uniqueness of the geology in these basins
- C. Anticipated industry behavior
  - Rates of well drilling
  - Rates of gas extraction

#### **Section 2 – Oil and Gas Exploration and Extraction**

- A. How hydrocarbons are generated and trapped in the Earth
- B. Methods used to find hydrocarbons
  - Geophysical methods
    - Seismic reflection
    - Gravity and magnetics
  - Lithologic and geophysical logs
  - Organic geochemistry indicators
- C. Methods to extract hydrocarbons
  - Conventional drilling and well treatment
  - Horizontal drilling
  - Hydraulic fracturing
  - Alternative fracturing techniques

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<sup>1</sup>Although the study language in Session Law 2011-276 speaks in terms of all of the state's oil and gas resources, the study will focus on the shale gas resource that has been identified in the Triassic Basin. The study will note where any findings and recommendations may have broader application to other potential oil and gas resources.

## **Section 3 – Potential Infrastructure Impacts**

- A. Water supply
  - Existing water sources
  - Existing water use
  - Projected water demand (based on local water supply plans)
  - Expected additional water use for drilling and hydraulic fracturing, including cumulative impacts from multiple wells
- B. Road and bridge infrastructure
  - Existing condition and effects of increased use
  - Safety considerations
- C. Transportation methods
  - Pipeline availability
- D. Wastewater treatment
  - Existing wastewater treatment capacity
  - Wastewater treatment needs associated with oil and gas activity (both industrial and domestic wastewater)

## **Section 4 -- Potential environmental and health impacts**

- A. Constituents and contaminants associated with hydraulic fracturing
- B. Groundwater impacts
  - Location of water supply wells (public and private)
  - Potential for contamination by constituents of fracturing fluids
  - Potential for methane release
  - Well construction standards
  - Spills and releases to groundwater
  - Potential public health impacts
- C. Process wastewater
  - Disposal
  - On-site storage
  - Potential for recycling
- D. Surface water impacts and stormwater management
  - Erosion and sedimentation issues during production and following reclamation of well pads
  - Post-development runoff
  - Environmentally sensitive site design

- Surface spills and releases from the well pad
  - Spills and releases during transportation and storage
  - Potential public health impacts
- E. Air quality impacts
- Air emissions, including fugitive emissions and flaring
  - Greenhouse gases
  - Air quality permitting requirements
  - Potential public health impacts
- F. Impacts on fish, wildlife and important natural areas
- Threatened and endangered species
  - Location of parks, designated state nature preserves, other significant natural areas
  - Potential impacts to livestock from spills, releases and air emissions
  - Potential impacts to fish and wildlife , including fragmentation of habitat
  - Potential impacts to recreational fishing and hunting
- G. Management and reclamation of drilling sites (including orphaned sites)
- H. Management of naturally occurring radioactive materials (NORM) generated by the drilling and production of natural gas
- Potential public health impacts
- I. Potential for increased seismic activity
- J. Solid and hazardous waste generated in the extraction process
- Disposal methods
  - Potential public health impacts

## **Section 5 – Potential economic impacts**

- A. Estimate of jobs created
- Temporary vs. permanent jobs
  - Type and quality of jobs
  - Industry use of local labor vs. imported labor
  - Ancillary job creation
- B. The timing of leasing, drilling, production and post-production costs as compared to the realization of economic benefits
- C. Impact on Existing Local Economy
- Agriculture
  - Retirees

- Wineries
- Local food industry
- Tourism
- Others

D. Potential impacts to North Carolina energy consumers

- Extraction versus combustion of natural gas
- Consideration of energy security
- Available and necessary infrastructure to export natural gas

E. Fiscal impacts to local government

- Roads and other infrastructure
- Emergency services
- Schools
- Social services
- Police and criminal justice

F. Additional state resources needed to provide regulatory oversight

- Cost of implementing an oil and gas regulatory program
- Increased natural resource management costs, including review of impacts to threatened and endangered species
- Others

G. Comparison of existing bonding requirements to those in other oil and gas states

H. Comparison of existing severance taxes to severance taxes or royalty payments in other oil and gas states

I. Use of special assessments

J. Estimate of revenue generated by severance taxes or royalties at levels comparable to other oil and gas states

K. Fees for permitting of oil and gas exploration and extraction activities

- Current environmental permitting fees in North Carolina
- Fees in other oil and gas producing states

L. Recommendations for funding state regulatory oversight

- Appropriate level of severance taxes or royalty payments
- Recommendations for new or modified permit fees

M. Other recommended uses for oil and gas revenue

- Improvement of water and wastewater infrastructure
- Remediation of contaminated sites
- Land and water conservation

## **Section 6 – Potential social impacts**

- A. Impacts on nearby communities from drilling operations
  - Housing availability
  - Property values
  - Demand for social services
- B. Impacts on quality of life within nearby communities, including impacts on:
  - Recreational activities
  - Commercial and residential development
  - Noise from construction and drilling operations
  - Visual impacts from construction and drilling operations
  - Crime rates

## **Section 7 – Proposed regulatory framework**

- A. Guidance for development of a regulatory framework
  - Coordination with existing and pending federal regulations
  - STRONGER standards for state oil and gas programs
  - State-by-state review of oil and gas programs, including enforcement
  - Other sources of recommended standards
  - Public comment
  - Existing state policy
- B. Recommended policies to guide regulation of oil and gas development
- C. Recommended regulatory framework
  - Public participation
  - Interagency coordination
  - Criteria for approval of exploration and development activities, including permit requirements
  - Scope and frequency of inspection
  - Compliance and enforcement procedures
  - Data management

## **Section 8 – Consumer protection and legal issues**

- A. Landowner property rights under existing North Carolina law
- B. Landowner rights and risks

- Split estates
- Impacts to landowners, including disclosure
- Differences and similarities in approaches to protecting the rights of surface owners versus those of mineral owners

C. Mineral leases and protection of landowners

D. Forced pooling

## **Section 9 – Recommendations and Limitations**

A. Recommendations

- Whether or under what conditions N.C. should allow hydraulic fracturing and horizontal drilling
- Issues requiring further research
- Baseline data collection
- Additional recommendations (to be determined)

B. Limitations of the Study

## **Section 10 – Other issues**

Appendix      Session Law 2011-276  
                    Summary of Public Comment