

**TESTIMONY SUBMITTED TO
THE HOUSE COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEE ON ENERGY AND MINERAL RESOURCES**

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DAKOTA**

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Good morning Chairman Costa, Ranking Member Lamborn, and members of the Committee. My name is Lynn Helms. I am the Director of the Department of Mineral Resources of the Industrial Commission of the State of North Dakota. I am here today representing the Industrial Commission, the State of North Dakota, and other member states of the Interstate Oil and Gas Compact Commission (IOGCC) to express my views as a state regulator on development of shale gas in the United States and as to the outstanding job that states are doing in regulating the development of this most important national resource.

The 30 member states of the IOGCC are responsible for more than 99% of the oil and natural gas produced onshore in the United States. Formed by Governors in 1935, the IOGCC is a congressionally chartered interstate compact. The organization, the nation's leading advocate for conservation and wise development of domestic petroleum resources, includes 30 member and 8 associate states. The mission of the IOGCC is two-fold: to conserve our nation's oil and gas resources and to protect human health and the environment. Our current chairman is Governor Brad Henry of Oklahoma.

In my testimony today I propose to begin with some information on the Bakken shale formation in North Dakota and, how, thanks to recent technological advances, it is providing this country with an abundant and critical domestic energy resource. I will also provide testimony as to the competency and commitment of state oil and gas regulators to protect our states' drinking water resources in the development of the country's shale energy resources.

North Dakota's Bakken Resource

Let me begin by talking about the Bakken formation. I note that because of high crude oil prices in 2007 and 2008 and the discovery of new technology that has made it possible to economically produce the Bakken formation in North Dakota and Montana, the state of North Dakota has recently moved from the country's 9th ranked state in daily oil production to number 5.

The Bakken Formation is a large unconventional oil and gas resource that underlies most of western North Dakota, eastern Montana, southeast Saskatchewan, and southwest Manitoba. The U.S. Geological Survey (USGS) stated in an April 2008 report that it is the largest continuous resource they have assessed in the lower 48 states.

The upper and lower members of the Bakken formation are world class petroleum source rocks. Published estimates of Bakken oil generation potential range from 10 billion barrels (Dow 1974) to 300 billion barrels (Flannery and Krause 2006). The unpublished work of Price estimated the Bakken oil generation potential at up to 503 billion barrels. An extensive oil sampling program conducted by the North Dakota Geological Survey has shown that the Bakken is “truly dysfunctional” with no evidence that Bakken-generated oil has migrated away from the Bakken pool as previously thought. The geological models presented by Price (unpublished) and by Flannery and Kraus (2006) were based on input from North Dakota Geological Survey geologists, samples from the North Dakota Core and Sample Library, and the well files from the North Dakota Oil and Gas Division establish the most likely range of oil and gas in-place estimates of 300-500 billion barrels of oil and 300-500 trillion cubic feet of associated natural gas.

This incredible resource was identified by geologists within months of the first commercial oil production in North Dakota in a well drilled on a farm north of Tioga, ND in 1951. Yet, economic production was rare until the remarkable technologies of the 21st century were brought to bear, including deep, long horizontal wells with multiple hydraulic fracture treatments. I might note that research funded by the U.S. Department of Energy (DOE) Office of Fossil Energy has helped advance these shale technologies, and I encourage strong Congressional support of the program.

Significantly, even after applying the latest tools available, the Bakken Formation is expected to yield only **1.4%** of its original oil in place, which is still a remarkable **4-7 billion barrels of oil and 4-7 trillion cubic feet of natural gas**. The Bakken play in North Dakota is still in the learning curve. North Dakota wells are still undergoing adjustments and modifications to the drilling and completion practices used for this formation. It is apparent that technology and the price of oil will dictate what is potentially recoverable from this formation. The current Bakken shale recovery estimate equals all U.S. crude oil imports from the Persian Gulf since 2000 and a full year of residential natural gas consumption for our nation. The proven portion of the middle Bakken member occupies over 8.4 million acres in western North Dakota. The current North Dakota drilling rig fleet is capable of developing 300,000 to 650,000 acres per year meaning full development could require 13 to 26 years and over 13,000 new wells each hydraulically fractured from 2 to 20 times. This is lot of energy for our country and jobs for the American economy.

State Regulation of Oil and Natural Gas Development

I'd like to now address the issue of how development of this shale resource in North Dakota, and throughout the country, is regulated so as to also protect and preserve our country's precious water resources. It is useful to understand the critical role that states play in the regulation of oil and natural gas resources in the United States. A history of oil and natural gas in North Dakota can serve as an illustrative example.

North Dakota Oil and Gas Regulatory History

In response to shallow natural gas discoveries used for domestic lighting and heating the North Dakota Legislature passed an oil and gas conservation law that prohibited production of gas unless it was tied to a distribution system in 1911. The 1941 Legislature later passed the first meaningful regulatory bill under the urging of then State Geologist Wilson M. Laird. As a result, North Dakota had an oil-conservation law in place when oil was discovered in the State ten years later, but following that first commercial oil production in April 1951 North Dakota saw the need to be part of the organization chartered by congress to assist states with oil and gas regulation. North Dakota joined the Interstate Oil Compact Commission in 1953 and the North Dakota Legislature revised the Oil and Gas Conservation Law to conform to the IOCC Model Act that same year. A Chief Petroleum Engineer was hired who immediately updated the rules to reflect the new law. Most states that produce oil and gas share a similar history and are also members of the IOGCC.

Every North Dakota Governor since 1987, around the time when North Dakota became one of the top 10 U.S. states in daily oil production, has chaired the organization.

The highlight of IOGCC meetings since 1988 has been the Council of State Regulatory Officials. At meetings of this group, the top oil and gas regulatory official of every member state and every oil and gas producing Canadian province, or their designee, shares with the group the top issues in their state or province. Recommendations from other states that have or are working with similar issues are frequently solicited. This forum allows state regulators to respond to new issues very quickly, consistently, and collaboratively. For example, within weeks of a recent home explosion in Ohio state regulatory officials were discussing the investigation by the Ohio Department of Natural Resources and the primary cementing failure that caused it. Another example of the efficacy of such a program is the frequent updates on the LEAF lawsuit and group discussions of the issues surrounding hydraulic fracturing in the United States that ensued.

When I began this job almost eleven years ago the relationship between the North Dakota Oil and Gas Division and other state and federal agencies whose jurisdiction overlapped in many areas was very mixed. Realizing that relationships change as do agency directors we moved aggressively to develop Memoranda of Agreement with those agencies that provide structure for both the regulators and regulated community and provide for period review and change. A national example of this is a Memorandum between the IOGCC and the U.S. Environmental Protection Agency (EPA) which provides for a process under which states and EPA regularly meet as environmental co-regulators.

Regulation to Protect Water Resources

As the head regulator of oil and natural gas development in the State of North Dakota and an officer of the IOGCC representing all oil and natural gas producing state regulators, I can assure you that we have no higher priority than the protection of our states' water resources – let me repeat no higher priority. Much of our entire regulatory framework, from drilling to completion, production, and finally plugging and abandonment, is centered around measures to prevent any contamination of the water resource. As a component of the completion of a well, hydraulic fracturing operations are thus thoroughly regulated and supervised by the states.

A major component of production operations is the proper storage and disposal of all production wastes, including hydraulic fracturing flow back water. These operations are carefully monitored, audited, and regulated in our state programs.

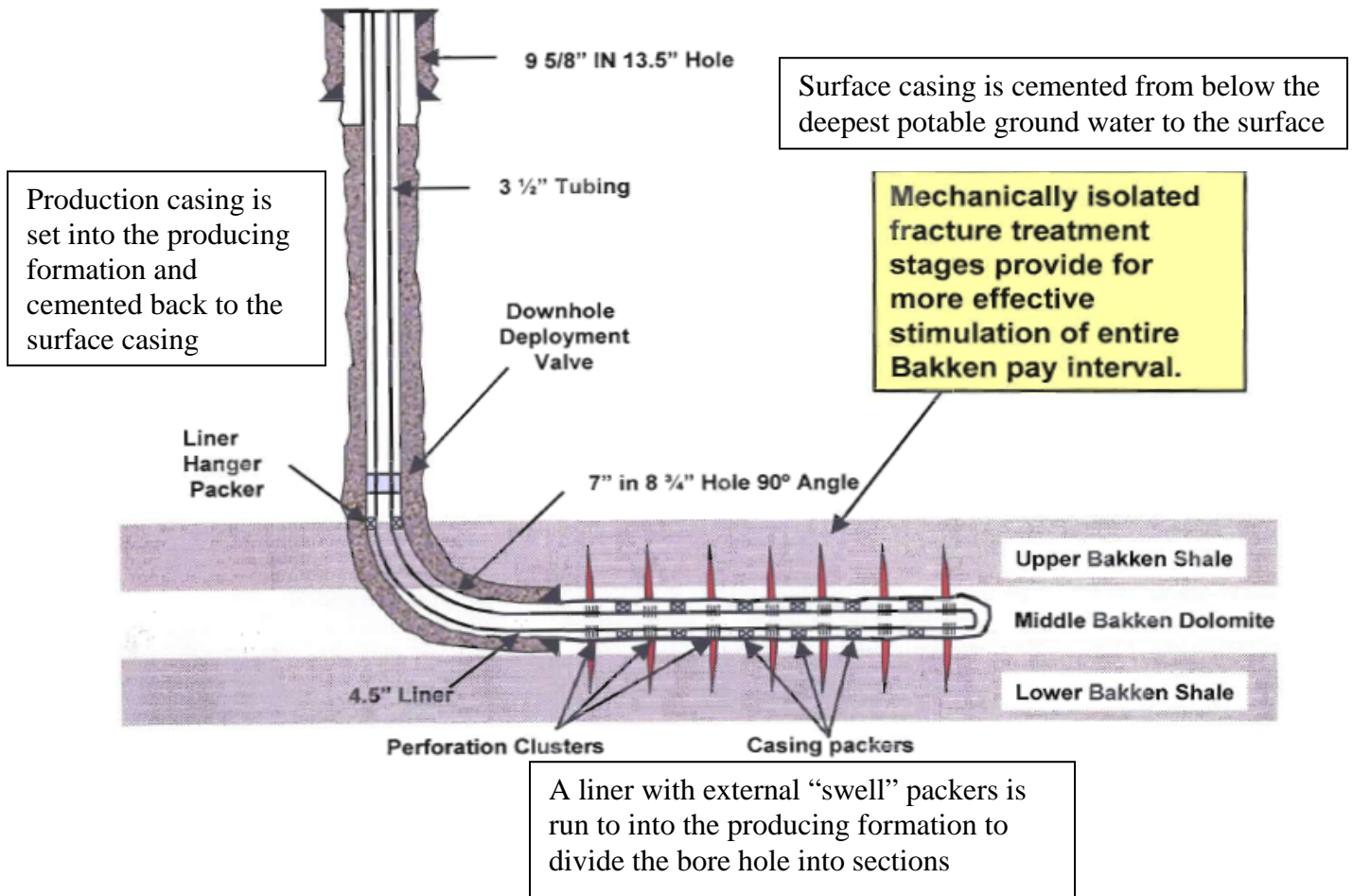
As I noted in my testimony above, hydraulic fracturing is a critical component of developing the Bakken formation, indeed every shale play throughout the U.S. and Canada. Without hydraulic fracturing, under regulation of the states, this resource could not be produced.

I have included both a picture of a hydraulic fracture treatment near Lake Sakakawea in North Dakota (page 5) and a diagram of a typical Bakken formation well (page 6) that shows how it is that water resources are protected during the oil and natural gas production operations, including hydraulic fracturing.

ND hydraulic fracture treatment:



ND Bakken shale well bore:



Hydraulic Fracturing Is Environmentally Safe

In a 1998 survey of state oil and gas regulatory agencies, conducted by the GWPC, twenty four state programs said they had not recorded any complaints of contamination to a USDW that the agency could attribute to hydraulic fracturing of coalbed methane zones.

In 2004 the Environmental Protection Agency published a final report summarizing a study to evaluate the potential threat to underground sources of drinking water from hydraulic fracturing of coal bed methane production wells and the Environmental Protection Agency concluded that "additional or further study is not warranted at this time..." and that "the injection of hydraulic fracturing fluids into coal bed methane wells poses minimal threat to the underground sources of drinking water".

Subsequently, the IOGCC conducted a survey of North Dakota and other oil and gas-producing states that found that there were no known cases of ground water contamination associated with hydraulic fracturing. Hydraulic fracturing is a common operation used in exploration and production by the oil and gas industry in North Dakota and all the member states of the IOGCC. Approximately 35,000 wells are hydraulically fractured annually in the United States, and close to one million wells have been hydraulically fractured in the United States since the technique's inception, with no known harm to ground water.

It is my firmly held view and that of the IOGCC that the subject of hydraulic fracturing is adequately regulated by the states and needs no further study. In my opinion too frequent nationwide or federal study and review of critical operations like hydraulic fracturing, underground injection, and RCRA class II waste exemptions create an environment of uncertainty and litigation that inhibits real progress in sustainable resources development.

Complaints of ground water contamination attributed to hydraulic fracturing or any other oil and gas operation should continue to be investigated by the appropriate state agency or agencies to determine whether or not ground water has been affected and whether a cause and effect relationship can be established between any impacts to ground water and petroleum exploration and production activities.

Summary

The state of North Dakota and the IOGCC are firmly committed to the premise that regulation of oil and gas field activities is managed best at the state level where regional and local conditions are understood and where regulations can be tailored to fit the needs of the local environment. Federal regulatory programs have been most effective when they have been delegated to state regulatory agencies and funded through primacy programs. The primary example of this success has been the 1974 Safe Drinking Water Act (SDWA) section called the Underground Injection Control (UIC) Program. Between 1982 and 1990, twenty oil producing states applied for and received primary enforcement authority (primacy) from EPA to administer the program under Section 1425 of SDWA. Delegation of authority for this program to the states has required those with oil and gas regulatory programs to demonstrate that their programs were equally effective in protecting ground water as those

promulgated and administered by EPA under Section 1422 of SDWA. Federal regulatory programs that can not be delegated to state regulatory agencies and funded through primacy programs have been a constant source of friction between regulators and it has been much more difficult to achieve compliance. The primary example of this success has been the 1990 Oil Pollution Act (OPA) and Spill Prevention Control and Countermeasure (SPCC) regulations.

Regulations alone don't begin to provide the full measure of a regulatory program. The North Dakota Oil and Gas Division of the Department of Mineral Resources utilizes 8 performance measures to monitor our activity in the areas of drilling permitting, UIC permitting, wellbore construction, well bore mechanical integrity testing, spill containment and clean up, fluid measurement, oil and gas conservation, and customer satisfaction. At least five of these measures are directly related to protection of water resources. These performance measures are backed up by a staff of field inspectors who visit the wells every day from when the drilling rig moves in until the permanent wellhead is installed and at least quarterly after that.

North Dakota has participated in numerous work groups whose purpose was the development of Best Management Practices (BMPs) and regulatory review processes. While these efforts have done a great job of documenting the evolution of technology used to address and mitigate problems real or imagined they result in snap shot views of BMP or regulatory practices at a point in time and they do not result in living documents that keep up with the industry. For example, North Dakota participated in a deep unconventional natural gas BMP work group, which finished its work just as industry focus shifted to coal bed methane, sparking another BMP work group which again finished its work just as industry focus shifted to unconventional oil and gas shale utilizing horizontal drilling and hydraulic fracturing.

Regular meetings of regulatory officials such as the IOGCC's Council of Regulatory Officials and EPA Task Force are the most effective way for regulators to keep pace with the rapid shifts in energy industry focus in real time.