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Regulating Change

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Abstract

As part of a cooperative agreement with the United States Department of Energy (DOE) -- entitled *Technology's Impact on Production: Developing Environmental Solutions at the State and National Level* - the Interstate Oil and Gas Compact Commission (IOGCC) has been tasked with assisting state governments in the effective, efficient, and environmentally sound regulation of the exploration and production of natural gas and crude oil, specifically in relation to orphaned and abandoned wells and wells nearing the end of productive life. Project goals include:

Developing (a) a model framework for prioritization and ranking of orphaned or abandoned well sites; (b) a model framework for disbursement of Energy Policy Act of 2005 funding; and (c) a research study regarding the current status of orphaned wells in the nation.

Researching the impact of new technologies on environmental protection from a regulatory perspective. Research will identify and document (a) state reactions to changing technology and knowledge; (b) how those reactions support state environmental conservation and public health; and (c) the impact of those reactions on oil and natural gas production.

Assessing emergent technology issues associated with wells nearing the end of productive life. Including: (a) location of orphaned and abandoned well sites; (b) well site remediation; (c) plugging materials; (d) plug placement; (e) the current regulatory environment; and (f) the identification of emergent technologies affecting end of life wells. *New Energy Technologies --Regulating Change*, is the result of research performed for Tasks 2 and 3.

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Executive Summary

This report focuses on the effects of new and emerging technology over the last 20 years on the regulation of the domestic onshore oil and gas industry. Beginning with a description of legislative and regulatory responses to technologies and ending with recommendations on maximizing the benefits of new ideas and techniques, this report covers technology used by both regulators and oil and gas producers. These new technologies protect the natural environment while enhancing local economies and reducing dependence on foreign oil. Moving from exploration to well completion to plugging and abandonment, and finally, site remediation, this report discusses commonly used technologies, such as cell phones and laptop computers that allow the electronic filing of reports and other changes in working environments for both operators and regulators. More importantly, this report highlights the regulatory response to technologic innovations specific to the oil and gas industry. Emerging technologies are discussed in light of potential benefits as well as to share successes and challenges that could help others to bring these technologies into their operations more efficiently.

Technology is changing the way oil and gas exploration and production companies operate in the office and in the field. Communications and data management tools also are changing the way state oil and gas regulators protect the environment while managing energy resources for the public good. The goal of this report is to identify the technologies that are helping to bring this to fruition.

There is no question that producing energy affects the environment. There also is no question that Americans have come to enjoy a standard of living made possible by fossil fuel energy. The challenge of our time might well be to change the way we look at everything we use by taking to heart the popular slogan: Reduce, Reuse, and Recycle.

Technology is helping operators and regulators reduce many types of waste. Intel's introduction of the microprocessor in 1971 has revolutionized communications and data management, saving countless hours of time, untold volumes of paper, and the energy for incalculable miles of travel. High-tech drilling tools and techniques, such as directional drilling and hydraulic fracturing, are allowing greater production from fewer acres of land.

New and emerging water treatment technologies are helping oil and gas producers to reuse water multiple times, and closed-loop drilling fluid systems reduce the possibility of accidental spills and capture fluids for reuse. Operators also are finding ways to recycle wastes into usable products. Drill cuttings are being recycled into road-building materials in Texas and wetlands restoration in Louisiana.

When it comes to protecting the environment, the most critical factor might be to elicit a change in the way people view the byproducts of human consumption. The oil and gas industry is built on turning trash into treasure. Oil was considered a nuisance by those digging water wells, but once oil became valuable, water became the nuisance. Until Karl Benz developed the automobile, gasoline was considered too volatile to use and natural gas was rarely used as fuel until after World War II.

State regulators are adapting technologies for their use, but more importantly, they are adapting regulations to protect the environment and adjust to new technologies used in exploration and production. Most states are modifying oil and gas rules instituted 20 to 30 years ago to account for new knowledge and technologies that make it possible to reduce environmental impacts while producing

more oil and gas from fewer wells, including accommodating production from unconventional sources that recently have become technologically and economically viable.

Summary of Accomplishments for the Research Project

Protecting Our Country's Resources: The States' Case. Published in 2008, *Protecting our Country's Resources: the States'* Case documents the current state of orphaned and abandoned wells in the nation. The IOGCC has been studying orphan wells and the costs and regulations associated with managing these wells since 1992. Over the years, states have been the leaders in implementing innovative programs related to orphan well management. Most oil and gas producing states have established plugging funds derived from taxes on production, fees or other assessments to plug orphan wells. However, while states have established plugging funds, those funds are insufficient to address timely cleanup of the remaining orphan wells. Therefore, it's essential to establish innovative programs to plug existing orphan wells.

Model Framework for Prioritization and Ranking of Orphaned and Abandoned Wells / Model Framework for Disbursement of Epack Funding. The IOGCC [Orphan Well Task Force](#), comprised of representatives from member states, developed this model prioritization schedule and fund disbursement framework in order to address the requirements related to Section 349 of the Energy Policy Act of 2005, which provides for the establishment of a program to provide technical and financial assistance to oil and gas producing states to facilitate remediation of environmental problems caused by orphaned or abandoned oil and gas exploration or production well sites on State or private land.

New Energy Technologies: Regulating Change. Research associated with tasks 2 & 3, entitled *New Energy Technologies: Regulating Change*, is incorporated into the final scientific report and includes legal and regulatory responses to emergent technologies over the last twenty years. An Executive Summary, highlighting the report and findings and recommendations will be distributed. In addition, the full text of the report will be available for download on IOGCC's websites.

Groundwork. Groundwork, a user-friendly interactive Web site, incorporates research from all three project tasks and offers a multi-tiered approach for delivering state regulatory information. Groundwork makes information transfer convenient for researchers of state regulations about oil and gas production. www.groundwork.iogcc.org

Case/Studies Technical Presentations. Selected case studies were published and presented as part of the IOGCC Midyear Meeting in Anchorage, Alaska, May 2009. *Case Studies are presented as appendices to the report.*

2010 Investments in Energy Security. A catalogue of oil and gas incentive programs to assist government entities in developing and enhancing new and existing oil and natural gas stimuli.

Research Methodology (Experimental Methods)

The data for this study were gathered through informal surveys, letters, personal interviews, site visits, and published reports. Sources include government officials, regulatory agency employees, private oil and gas company owners and employees, oil and gas service-industry owners and employees, academics, trade publications, and government documents. Necessarily, much of the information is anecdotal and somewhat subjective. Statistics cited are identified by source. Estimates are based on published statistical evidence with the methodology and source identified.

In many instances, the actions of a particular state, or several states, are cited as examples of approaches to challenges faced by oil and gas development. It should be noted that in most of these cases, other oil- and gas-producing states are using similar approaches; the cited examples are deemed to be the most representative or inclusive.

RESULTS AND DISCUSSION

Introduction

The Regulation of Oil and Natural Gas from a Historical Perspective

Conservation or Preservation? Shaping the Future of Oil and Gas Regulation

“At this very moment, we have the necessary techniques, both material and psychological, to create a full and satisfying life for everyone.” – B.F. Skinner, Walden Two (Barnett, 2002)

Present day environmental attitudes are rooted in the era that also marked the beginning of the United States oil industry. In 1859, while Edwin Drake was drilling the nation’s first commercial oil well at Titusville, Pennsylvania, early naturalists and conservationists such as Henry David Thoreau, Walt Whitman, and Ralph Waldo Emerson were establishing an American tradition in both literature and environmentalism.

Among those influenced by these new American ideals was President Theodore Roosevelt, who worked to expand the National Park System and fought to preserve historic landmarks for future generations. Roosevelt was attracted to the ideas of writer and preservationist John Muir, founder of the Sierra Club. However, while Muir focused on preserving the environment, Roosevelt’s philosophies leaned more toward conservation as evidenced by his comment:

“Conservation means development as much as it does protection. I recognize the right and duty of this generation to develop and use the natural resources of our land; but I do not recognize the right to waste them, or to rob, by wasteful use, the generations that come after us.” (Roosevelt, 1910).

The philosophical divide between preservationists, such as Muir, and conservationists, like Roosevelt, shaped the history of oil and gas regulation. On one side are those who would limit oil and gas production to areas where there is zero risk of environmental impact (virtually nowhere). Their opponents seek a balance between the needs of man and nature.

The earliest regulation of oil and gas production began at the state and local levels in response to wasteful practices that were common before the markets and infrastructure existed to move crude oil

from the well-head to the consumer. Early laws frequently had as much to do with protecting the rights of landowners as they did with conservation.

In 19th-Century America, according to “rule of capture” common law, a landowner’s title extended with it whatever was captured on, or under, the owner’s land, be it animal, mineral, or vegetable. Because oil and gas deposits don’t respect man’s boundaries, a well drilled on one person’s land also can drain the oil from under his neighbor’s property. Not willing to let that happen, neighbors often rushed to drill their own wells. It was not uncommon for whole boomtowns to spring up seemingly overnight.

The rush to produce oil for small, undeveloped markets caused prices to collapse and, lacking sufficient storage to contain the excess crude, the owners often dumped whatever oil they could not sell or store.

Additionally, overproduction by early drillers resulted in inefficient recovery of resources, especially relative to their environmental impacts. Oil and gas exist under tremendous pressure underground, which is why early depictions of oil strikes commonly show a “gusher” shooting up into the air. In a rush to grab their share of the oil in a field, early producers actually cheated themselves by poking the ground so full of holes that the oilfield lost the pressure necessary to keep the oil flowing.

As a consequence of this haphazard, wasteful, and inefficient process, conservation and well spacing laws were among the first to be enacted. Oil producers pushed for regulation of their industry. Eventually, low prices and wasteful practices created a regulatory system that would evolve to encompass public health, safety, and environmental protection.

Well spacing regulations were developed to address the number of wells and distance between them within each oil or gas pool (an area having a common source of supply). In the early days of the industry, wells were drilled on any available surface tract, no matter how small. Some fields were developed in which it was possible to move from one well to another by walking across derrick floors. This practice resulted in a waste of materials and oil (Interstate Oil & Gas Compact Commission, 1951). To prevent premature loss of pressure and maximize the ultimate recovery of oil and gas, regulations were developed to limit the maximum production rate from each well.

Traditionally, state governments have retained regulatory enforcement duties. Development of oil and gas resources varies greatly from region to region based on geographic, geologic, and sociologic factors that state governments have developed the expertise to manage. Creating and enforcing

regulatory and permitting requirements at the federal level under the assumption that oil and gas exploration and production activities and issues are the same everywhere would hinder production of domestic resources while doing little to protect the environment.

The concept of wringing every bit of use out of an object before discarding it is not new. In fact, the idea of making products disposable, as opposed to durable, is a legacy of recent generations. Fortunately, the same human spark that drove the Industrial Revolution, the Space Race, and the Information Age—all accelerated by fossil fuel energy—is capable of finding innovative, environmentally responsible ways to reduce what we use, reuse what we can, and to find ways to recycle by making something new out of many of the materials we now routinely discard.

The oil and gas industry is built on turning trash into treasure. Consider that Edwin Drake chose the site on which to drill his first well based in part on reports that, instead of producing the fresh water or brine drillers were after, wells in the area often were found to be laced with crude oil. While some owners of water or salt wells probably considered the oil a nuisance, a few undoubtedly used the oil for fuel or sold it to others for medicinal purposes. Drake and other early oil pioneers saw an opportunity and turned it into an industry.

Another example of waste transformed into resource is natural gas. Until pipeline construction escalated, thanks to technologies developed during World War II, operators in most places burned off (flared) or released natural gas directly into the atmosphere as a byproduct of oil production.

It was not that natural gas was considered useless prior to World War II; the problem was transporting it from the well to the user. The first natural gas pipelines were made from bamboo shoots in China around 500 B.C.

Beginning in 1785, Britain sold gas produced from coal to heat homes and power streetlights. In 1816, Baltimore became the first U.S. city to use manufactured natural gas for streetlights. However, without pipelines to transport natural gas, the industry almost died out when electricity came into wide use (History).

“Industry is the biggest consumer of natural gas, using it mainly as a heat source to manufacture goods. Industry also uses natural gas as an ingredient in fertilizer, photographic film, ink,

glue, paint, plastics, laundry detergent, and insect repellents. Synthetic rubber and man-made fibers like nylon also could not be made without the chemicals derived from natural gas.”
(Secondary Energy Infobook)

“Before there was an understanding of what natural gas was, it posed somewhat of a mystery to man. Sometimes, such things as lightning strikes would ignite natural gas that was escaping from under the earth’s crust. This would create a fire coming from the earth, burning the natural gas as it seeped out from underground. These fires puzzled most early civilizations, and were the root of much myth and superstition. One of the most famous of these types of flames was found in ancient Greece, on Mount Parnassus in approximately 1,000 B.C. A goat herdsman came across what looked like a ‘burning spring’, a flame rising from a fissure in the rock. The Greeks, believing it to be of divine origin, built a temple on the flame. This temple housed a priestess who was known as the Oracle of Delphi, giving out prophecies she claimed were inspired by the flame. (History)

Once more of an annoyance than an advantage, clean-burning natural gas is now being touted as a bridge to the future and the path to American independence from foreign oil. New technologies to liquefy and transport natural gas (LNG) make it accessible to areas lacking pipelines, and previously unrecoverable gas from unconventional sources in the United States has added several years worth of reserves, making natural gas an attractive fuel as alternative renewable energy technologies are perfected. Recognizing the potential economic and environmental benefits of domestic natural gas production, IOGCC member and associate member states encourage environmentally sound production through legislative and regulatory incentives such as severance tax exemptions.

Gasoline provides yet another example of a waste stream turned asset. Before Karl Benz developed the gasoline-fueled automobile in 1885, gasoline was an unwanted byproduct of petroleum production because of its volatility. When used in kerosene lamps, gasoline was a frequent cause of house fires due to explosion. (History of ChEn: Timeline)

Regulatory responses to new and emergent technologies are a collective effort by legislators, federal, state, and local government, industry, and communities. These stakeholders utilize the tools of collaboration, individual state perspectives, and research to respond to evolving technological advances through legislation and regulation.

Industry Reduces, Reuses, and Recycles

With creative thinking and new technologies, the oil and gas industry continues to search for ways to reduce, reuse, and recycle. Industry examples of waste-stream-turned-asset include:

Reducing the amount of gas that is not recovered or burned off into the atmosphere -- Distributed generation technologies convert “stranded gas” — defined as natural gas that cannot be produced due to poor quality or lack of a pipeline — into electricity for use onsite.

Reusing drilling waste in wetlands restoration -- Researchers at Southeastern Louisiana University are using an on-campus mesocosm to test purified drill cuttings for use in wetlands restoration. The facility simulates tides, temperatures, and other variables in a controlled environment (Drill Cuttings).

Reusing drilling platforms to create artificial reefs -- The Minerals Management Service (MMS) “Rigs to Reefs” program improves offshore environments by toppling decommissioned platforms in areas with few natural reefs, such as the Gulf of Mexico. Fish and anglers enjoy the enhanced habitat.

Recycling treated drill cuttings and other petroleum wastes into strong, durable building materials, including bricks that meet EPA safety standards (Gonzalez, Crawley, & Patton, 2006), filler material for levee construction in New Orleans, and DOT-approved road construction materials in Texas that meet or exceed the engineering specifications of the products they replace (API).

Environmental Effects of Oil and Gas Production: It's an Industry, Folks

Oil and gas exploration and production involves many activities that potentially can impact the environment. Beginning with a thorough analysis of mountains of data to find the best place to drill, to drilling test wells and, hopefully, bringing a field into production, to restoring the site, and finally, to the eventual closure, the exploration and production process offers numerous opportunities to shrink the size of its environmental footprint. Laws and regulations are enacted to address the real and perceived environmental threats from oil and gas exploration.

Oil and gas extraction is an industrial application, similar in many respects to manufacturing and construction operations. Like manufacturing and construction, oil and natural gas exploration and production involves the conversion of natural resources into a product that contributes to an improvement in the nation's standard of living. Oil and gas exploration activities, like other industrial applications, have the potential to affect the environment. Concerns over environmental impacts generally fall into one or more of the following broad categories:

- Protecting human health and safety
- Protecting landscapes and water bodies
- Preserving air quality
- Safeguarding wildlife and vegetation
- Preventing noise and sight pollution

Any industrial activity involves risks for human health and safety. In the oil and gas supply chain common risks associated with exploration and production are the operation of machinery, transport and handling of materials and chemicals, management of associated byproducts and management of natural resources utilized for development.

Regulatory agencies and the communities they serve are invested in natural resources, the environment, and public health and safety. Building roads, installing power lines, excavating drilling pads, and other activities have the potential to impact the land, water, and wildlife. Potential sources of air pollution associated with oil and gas exploration and production include escaped gases, fossil fuel combustion engines, and dust and debris caused by excavation and traffic.

With the onset of unconventional production, more and more exploration and production activities are occurring in urban areas. Noise from compressors, equipment, and machinery can disturb residents

and wildlife. Drilling rigs and pads, and other structures are designed for utility and do not always fit into the landscape they are placed in.

Reducing Environmental Impacts – a Progression

The steady progress the oil and gas industry has made in reducing the size of its environmental footprint over the last few decades is remarkable. According to the American Petroleum Institute (API), using today's technology to develop America's largest and most prolific oilfield at Prudhoe Bay, Alaska, the resulting overall footprint would be 64% smaller than the area affected in the 1970s. The drilling impact area would be 74 percent less, surface roads would be reduced by 58 percent, and oil and gas separation facilities would be 50 percent smaller (ANWR Arctic Technology).

Researchers based in Texas have developed an "environmental scorecard" to determine the tradeoffs associated with implementing low-impact practices in environmentally sensitive areas. The Environmentally Friendly Drilling System (EFD) program takes what researchers call a "systems approach" to determining the types of impacts they need to look at and establish how those effects can be measured so that the environmental tradeoffs of low-impact practices can be evaluated accurately. Researchers say the scorecard "enables a dialog to be established and maintained among all interested, concerned, and affected stakeholders." The original scorecard was developed for a coastal margin ecosystem, but the group established a goal of developing a structure that could be followed to create a scorecard for use in other environments. (Houston Advanced Research Center)

This report (a) identifies new technologies and new knowledge that can eliminate or mitigate the environmental impacts of exploration and production activities; (b) determines how making use of technology can reduce, reuse, or recycle its waste products; and (c) studies how regulators are adapting as a result of new technologies and new knowledge. It is anticipated that by sharing this information,

operators and regulators will discover new solutions and avoid problems as they look for ways to protect the environment.

Responding to a Changing Energy Landscape

IOGCC member states have a history of successful regulation resulting in sound environmental practices. Issues vary from state to state, and experienced regulators across the nation have shown great leadership in protecting the environment. For the purposes of this report, regulatory responses to new and emergent technologies are categorized into the following broad segments:

- Regulatory Streamlining
- Resource Management
- Unconventional Gas
- Hydraulic Fracturing
- Water Use, Management, and Disposal
- Carbon Capture, Geologic Storage, and Transportation
- Marginal Wells
- Orphaned, Abandoned and Idle Wells

For each segment, a brief overview of applicable technologies is given. Descriptions of technologies are purposefully described in such a manner that they could be understood by those unfamiliar with oil and gas exploration and production. In some cases, definitions of technologies are provided.

Some technologies covered in this report are revolutionary because they have the potential to dramatically reduce the environmental footprint of exploration and production activity. These technologies receive the most attention. Also included are many new technologies that are important not so much for their huge impact, but because many small steps in the right direction lead to the finish line.

Legislation – Our Government at Work

In addition to a description of the technologies, recent federal and state legislation is discussed. Legislation can have many purposes: to regulate, to authorize, to proscribe, to provide (funds), to sanction, to grant, to declare, or to restrict. The most common forms of legislation that the IOGCC concerns itself with are resolutions, bills, and statutes.

I am not an advocate for frequent changes in laws and constitutions, but laws and institutions must go hand in hand with the progress of the human mind. As that becomes more developed, more enlightened, as new discoveries are made, new truths discovered and manners and opinions change, with the change of circumstances, institutions must advance also to keep pace with the times. We might as well require a man to wear still the coat which fitted him when a boy as civilized society to remain ever under the regimen of their barbarous ancestors.

– Thomas Jefferson

Resolutions. A resolution is the “official expression of the opinion or will of a legislative body.” Resolutions can be issued by federal, state, and interstate forms of government. Other entities, such as associations and nonprofit groups comprised of regulatory officials, will issue resolutions to demonstrate policy positions. The IOGCC issues resolutions in its capacity as an interstate form of government. Resolutions act as a consolidated message to legislative bodies. IOGCC resolutions represent the collective voice of the governors of the member and associate member states of the commission. IOGCC resolutions reflect the official position of the commission on issues that are deemed critical to conserving domestic oil and natural gas, environmental protection, and human health.

Bills. Before an item of legislation becomes law it is known as a bill. Bills are offered before legislative bodies for debate. An “appropriations bill” authorizes government expenditures; an “engrossed bill” is ready for final passage or passed by one house of the legislature; an “enrolled bill” is passed by both houses of the legislature; a “revenue bill” levies or raises taxes; “House” and “Senate” bills are bills under consideration by their respective entities, while “joint” bills are sponsored by both entities.

Statutes. A statute is a formal written enactment of a legislative body or “law.” Additionally, legislation generates:

- (1) Committee hearings, reports, documents, and committee prints;
- (2) Floor debates; and

(3) Separately bound legislative histories. (Blacks)

In 1935, six states took advantage of a constitutional right to “compact,” or agree to work together, to resolve common issues. Faced with unregulated petroleum overproduction and the resulting waste, the states endorsed and Congress ratified a compact to take control of the issues. The result was a unique multi-state government agency now known as the Interstate Oil and Gas Compact Commission. Because each state has its own challenges, the commission, which currently represents 38 oil and gas producing states, continues to focus on the development of model legislation that states are able to tweak to adapt to their requirements.

In each segment of the report, legislation, laws and regulation, and additional state resources are provided in charts by state and topic.

What is Regulation?

Regulation

“The act or process of controlling by rule or restriction; a rule or order having legal force usually issued by an administrative agency (Garner, 2006).”

Regulation occurs at the federal, state, and local levels. In general, oil and natural gas production is regulated at the state level, although in some instances federal oversight prevails. Regulatory authorities utilize rule development, compliance, enforcement, and incentives to achieve the dual mission of protecting health, safety, and the environment while conserving natural resources.

Important to laws and regulation discussion are references to tax incentives and other resources. The IOGCC publishes an annual catalog of oil and gas incentive programs to assist government entities in

developing and enhancing new and existing oil and natural gas stimuli. The term incentive is used more broadly than in traditional context. It is not limited to tax incentives, but includes any program that assists oil and natural gas producers in the efficient recovery of petroleum resources while maintaining health and environmental protection (Interstate Oil and Gas Compact Commission, 2007). Incentive programs and services, combined with regulatory practices, are the means through which states protect the environment and stimulate local, regional, and national economies.

This report provides quick statistics, fact sheets, and other references to give an at-a-glance snapshot of current regulatory practices. State stories and case studies give a more in-depth view of how regulators respond to technology in individual states and give the perspective and approach of the states. Additional studies and resources are listed for future reference.

Why States Regulate Oil and Natural Gas Production

Minerals are owned by state citizens;

Geology varies from state to state;

Climate varies from state to state;

One size does not fit all.

**Adapted from presentation by William Sydow, Director,
Nebraska Oil & Gas Conservation Commission*

IOGCC's Model Rules and Regulations

In many cases, the IOGCC has developed model legislation, rules, and regulatory guidance that states are then able to adapt to their individual requirements. The IOGCC often will form a specialized work group or task force to address common issues and develop model legislation and rulemaking guidance. IOGCC's collaborative work groups are comprised of state oil and gas lawyers, regulatory authorities, local, state and federal agencies, content-area experts, industry representatives, and other stakeholders. Typical projects include development and review of statutory and regulatory guidance

documents, assistance with development and analysis of project research, assistance with the achievement of communications objectives, and provision of professional expertise. For each segment, model legislation, rules, and regulatory guidance and their effects are discussed.

Chapter 1. Regulatory Streamlining

Regulatory Streamlining

The IOGCC defines regulatory streamlining as a thoughtful process of making regulations and compliance simpler, saving money for both government and the regulated community, all without decreasing regulatory effectiveness.

Streamlining is a constant process that evolves with technology, modernized business practices, government capacity and emerging regulatory needs. Some of the goals of the streamlining process include stimulating local and state economies through tax revenues, increased job opportunities, and ancillary business development while protecting the environment through appropriate regulation and technological effectiveness and efficiencies.

Regulatory streamlining is the procedure that regulatory agencies go through to improve processes, increase efficiencies and improve the effectiveness of the process. Regulatory streamlining involves much more than issuing more permits faster. Regulatory streamlining incorporates:

1. Improving and promoting operating efficiencies both in and out of the field and the office;
2. Simplifying and clarifying regulatory processes and requirements for the regulated community;
3. Utilizing the most efficient and effective technologies;
4. Including surrounding communities and other stakeholders in the decision-making processes;
5. Emphasizing a cooperative compliance approach from the regulated community; and
6. Encouraging intra- and inter-state collaboration to avoid duplication of efforts and promote a seamless approach to resource management.

For the purposes of this discussion, regulatory streamlining is broadly broken into the following categories:

- Data Access, Web-Based Applications and GIS Mapping;
- Permitting;

- Communications; and
- Inter- and Intra-state Collaboration.

Data Access, Web-Based Applications, and GIS Mapping

State regulatory agencies are finding ways to take advantage of the ability to acquire and process data faster and more efficiently. Most producing states are working to integrate computer technology into their record-keeping and permitting processes by digitizing records and accepting online drilling permit applications.

A critical decision-making tool for all parties involved in oil and gas development is appropriate, accurate information. State regulatory agencies, communities, and planning partners use information about existing fields, production histories, and permitting information to plan, regulate, and monitor the environmentally safe and efficient development of domestic natural resources.

Advances in computer technology that make possible the ever-expanding array of tools and toys that some users might consider indispensable -- such as cell phones, iPods, and video games -- have important implications for finding and producing the oil and gas that we depend on every day.

Intel's introduction of the microprocessor in 1971, followed in 1981 by IBM's PC, dramatically changed how people work and play. And more changes are coming. The first microprocessor held more than 2,300 transistors, but modern microprocessors have a capacity of more than 230 million transistors, and according to Moore's Law, that number can be expected to double every two years (The Mother of All CPU Charts 2005/2006 : Charts Updated With Dual Cores - Review Tom's Hardware).

Access to Data Becomes Faster and More Efficient in "Real Time"

One of the most useful applications of advanced computer technologies is the capacity to send data in "real time." Among wireless Internet, satellite, cell phones, Personal Digital Assistant (PDAs), and laptop computers, there virtually is no document that cannot be sent around the world almost instantly. Many state oil and gas regulatory agencies are equipping and empowering field staff with mobile computing resources that they did not have in the past. Conditions in the environment (e.g. temperature, shock, vibration, moisture, dust, etc.) in which these workers operate dictate that the mobile computing devices be rugged and built to withstand the elements. Deployment of these devices

in the field lays the foundation for empowering staff with the ability to find, store, and exchange information in real time and on-site.

Access to real time data saves time, energy, and travel at every stage of oil and gas exploration and production from researching land ownership records at the county courthouse to remote monitoring of wells and pipelines hundreds or even thousands of miles away. North Dakota is one example where the state's field inspectors use cell phones and laptop computers to conduct their daily rig and well site inspections. According to Dave Hvinden, executive staff officer at the North Dakota Industrial Commission's Oil and Gas Division, having instant access to records helps inspectors protect the environment because they can verify well logs to make sure crews place cement plugs properly to prevent communication of fluids between formations and protect freshwater aquifers (Interstate Oil and Gas Compact Commission, 2008). North Dakota also is looking into e-Learning Modular Objects (ELMO) digital video presentation equipment for its monthly hearings in Bismarck. Witnesses are allowed to testify via telephone, reducing the necessity to travel to meetings, which provides financial and environmental benefits.

GIS and GPS Applications

Computer applications allow oil and gas companies to analyze and interact with a variety of data from multiple sources simultaneously. Geographic Information System (GIS) applications use Global Positioning Systems (GPS) and other tools to assimilate information like topography, soil analysis, climate, property ownership maps, and digitized aerial photos to develop prospects and site plans for oil and gas exploration with minimal environmental impact.

Communications

The phrase, "It's a small world" has taken on new meaning as the ability to communicate long distances has developed at breakneck speed over just a few decades. With any technology, there are the early adapters and those who wait to see how well it works and when it will become more affordable.

Along with taxi services, fire departments, and law enforcement agencies, the oil and gas industry was among the early adapters of the commercial two-way communications technologies that evolved for military use during World War II. The oil and gas industry was also among the earliest users of the now all but forgotten communications device, the pager.

Even with radios and pagers, oilfield workers remained mostly out of touch with headquarters until they drove into town to find a payphone from which they called in daily reports.

With the advent of modern communications technologies, today's oilfield worker is virtually never far from the home office—whether it is located on the far side of the county or the far side of the world.

State regulators have adapted to communications technologies more slowly than industry, but that is changing rapidly as technologies prove themselves and come into a price range that taxpayers are willing to support. Field inspectors are gaining access to communications technologies that allow them to find and use important data much more quickly than before. Kansas regulators, for example, are equipping field inspectors with satellite phones because sparsely populated areas of the state lack cell phone towers to carry signals.

Communications technologies protect the environment by increasing efficiency and reducing unnecessary traffic to drill sites. In many cases, travel—and its environmental effects—is eliminated because technology makes it possible to “meet” without actually meeting.

Capture, Analysis, and Transmission of Data

Information gathered onsite, such as the characteristics of rocks brought up from downhole, can be sent to an office where it might be analyzed by a team of geologists. Sophisticated downhole monitoring tools deliver up-to-the-minute information that helps geoscientists make decisions that ultimately might shorten the time a drilling rig spends onsite.

Many states utilize digital cameras, laptop computers, and mobile Internet access in the field. In Texas, every field inspection vehicle is equipped with a digital camera and a Toughbook laptop that utilizes a cell phone for Internet connection. Each Toughbook is equipped with the Rail Road Commission's software for GIS purposes. Assignments can be sent from one of nine district offices to inspectors via e-mail and digital photos taken onsite can be uploaded and transmitted immediately. It is anticipated that inspectors soon will be able to conduct inspections and upload data directly into the commission's database remotely. The Wyoming Oil and Gas Conservation Commission supplied all field technicians with GPS and digital cameras in 1998 for the purposes of getting accurate locations of wells and tank batteries. New Mexico uses digital cameras, laptops, and GPS in its inspection processes.

In some instances, data that were collected years, or even decades, ago is re-analyzed and used with new drilling technologies to go after hydrocarbon deposits left behind in mature fields. Redeveloping existing fields is an environmentally responsible conservation method because most of the infrastructure, such as access roads and pipelines, is already in place.

Additionally, the abundance of data available on the geology of mature fields and the experience gained from earlier drilling can reduce drilling time substantially. The sooner a well can be brought into production, the sooner the site can be reclaimed. State regulatory agencies will often work with local universities and utilize intra-agency collaboration to provide real-time access to data and information for the safe, responsible, economic development of oil and natural gas.

“You read about technological revolutions, the Industrial Revolution, and here was one happening and I was part of it.” – Steve Wozniak, who with Steve Jobs invented the first ready-made personal computer and created Apple (Barnett, 2002)

Approach of the States

Most states have instituted repositories for data through state geological surveys, local universities and special programs that are available to operators and the public. With the advent of the Internet, almost every state has some type of Web-based access to data and other resources. A few state programs are highlighted in the table below.

Table 1. State Resources and Programs: Data Access, Web-based Applications, and GIS Mapping

Access to real-time data saves time, energy, and travel at every stage of oil and gas exploration and production. Computer applications allow oil and gas companies to analyze and interact with a variety of data from multiple sources simultaneously. Geographic Information System (GIS) applications use Global Positioning Systems (GPS) and other tools to assimilate information like topography, soil analysis, climate, property ownership maps, and digitized aerial photos to develop prospects and site plans for oil and gas exploration with minimal environmental impact.

State	Alabama
Category	Resource
Citation	Rule 400-1-3-.10 of the Code of Alabama (1975)
Title	<i>Geophysical Logs; Core and Sample Library</i>
Discussion	Alabama's Oil and Gas Board, working in conjunction with the Geological Survey of Alabama, began in 2001 to generate digital copies of all well geophysical logs, 49,100 in all. Historically, the Oil and Gas Board required operators to submit two hard copies of all logs. The board stored one log as a permanent record and made the other available for copying. Now, only one copy is required, and when the office receives logs, workers scan them for digital storage, reducing both paper and space requirements. Since the public learned that they can access well logs digitally, orders for those files have far exceeded requests for paper copies (IOGCC, 2008). Alabama is also working to add digital files of other historic documents and scanning new files as they come in to further streamline operations, and staff is working to develop online permitting and reporting capabilities. The state believes that having more information digitally accessible, especially well logs, encourages oil and gas companies to spend their exploration dollars in Alabama rather than another state that has incomplete or inaccessible data. The Geological Survey of Alabama maintains a core and well sample library that includes cuttings from 4,000 oil and gas wells, core from 1,700 oil and gas wells, cuttings from 2,800 water and stratigraphic test wells and core from 350 industrial mineral core holes. Rules and regulations of the Oil and Gas Board require that exploration companies submit cores and drill cuttings following the completion of wells. Rule 400-1-3-.10 of the Code of Alabama 1975 states in part that "a complete set of cuttings, correctly labeled and identified as to depth, shall be filed with the board within 30 days from the time of completion of any well unless otherwise approved by the supervisor. If cores are taken, a complete set of cores, either whole or at least quarter slabs, correctly labeled and identified as to depth, shall be filed with the board within six months from the time of completion of any well unless otherwise approved by the supervisor." The facility has four viewing rooms for use by operators and researchers. Goals: To encourage oil and gas production by making useful data available to producers and to counteract the loss of infrastructure in the independent industry
URL	
State	Arkansas
Category	Resource
Citation	
Title	<i>Fayetteville Shale Natural Gas -- Reducing Environmental Impacts (Website)</i>

Discussion	The University of Arkansas and Argonne National Laboratory developed a web-based software application designed to help small E&P companies reduce environmental impacts while developing the low-permeability, tight gas shales of the Fayetteville Shale. Developers designed the tool to help producers navigate federal and state regulatory requirements and evaluate alternative leasing layouts to manage development with an eye toward environmental protection. ("Fayetteville Shale: Reducing the environmental impact of natural gas development")
URL	http://lingo.cast.uark.edu/LINGOPUBLIC/
State	California
Category	Resource
Citation	
Title	<i>Web-based Access to Data and Information</i>
Discussion	California's Department of Oil, Gas Geothermal Resources offers comprehensive web-based access to data and information. Online mapping, online production and injection data, and online well record searches can all be conducted from their web site.
URL	
State	Kansas
Category	Resource
Citation	
Title	<i>Simplified On-Line Automated Reporting (SOLAR)</i>
Discussion	The Kansas Corporation Commission (KCC) has been working with the University of Kansas on a Website application that eventually will link operations between the Kansas Geological Society, the Department of Revenue, county appraisers, and the Commission. Operators can create their own account online that they can use to file for drilling permits, check the status of applications, report revenues, and other tasks that once required paper and a trip to the office. The project, which Kansas calls SOLAR for Simplified On-Line Automated Reporting, has been extremely successful. Implemented in the spring of 2008, the program was receiving half of the permit applications online by September. According to Doug Louis, Director of the KCC Conservation Division, the success lies in careful beta-testing to work out glitches before the roll-out of the product. Louis says that the system cuts down on the number of calls that office personnel must handle. Another benefit of the system is accuracy; SOLAR has a built-in "dummy check" that will not allow a permit application to go forward online if the location does not match a location on the system. (IOGCC, 2008)

URL	https://solar.kgs.ku.edu/welcome.cfm
State	Kansas
Category	Resource
Citation	Kan. Stat. Ann. § 76-322
Title	<i>Kansas Geological Survey</i>
Discussion	The Kansas Geological Survey (KGS) conducts research and provides information about the state's petroleum resources. KGS conducts programs for the petroleum industry so the state will continue to enjoy the benefits of revenue generated by the industry and provides the petroleum industry with the benefits of research and information, as the state land grant schools provide support to the agricultural industry. This is to encourage the development of natural resources of economic value. Impact: Oilfields have been discovered based on KGS research. The KGS is widely recognized as being the source of much petroleum information and for its work on problems posed by the industry. The survey frequently appears before legislative committees to support tax incentives and provides technical assistance to the industry.
URL	
State	Kentucky
Category	Resource
Citation	
Title	<i>Kentucky Geological Survey, University of Kentucky</i>
Discussion	The Kentucky Geological Survey has an electronic library of scanned plats, completion reports, logs, and plugging affidavits, and will soon have flowlines and gathering lines.
URL	
State	Louisiana
Category	Resource
Citation	
Title	<i>SONRIS and Interactive Haynesville Shale Mapping Site</i>

Discussion	Online production reporting, well database access (SONRIS), GIS Interactive Map system, and a wide variety and large quantity of information are available through the Office of Conservation Website. The Louisiana Haynesville Shale Website concerns hydraulic fracturing in the Haynesville Shale and offers interactive maps, GIS data download site, FAQs, and other pertinent information.
URL	http://dnr.louisiana.gov/haynesvilleshale/
State	Michigan
Category	Resource
Citation	
Title	<i>West Michigan University Core Repository</i>
Discussion	The repository offers electronic submittal of hydrocarbon production reporting. Downloads and information can be found at the Office of Geological Survey.
URL	
State	Nebraska
Category	Resource
Citation	
Title	<i>Commission Website</i>
Discussion	The Nebraska Oil and Gas Conservation Commission offers an excellent array of data from its Website. Data include shape files of the state and surveyed subdivision in electronic format for use by anyone who uses various software packages to construct maps. Well data is supplied electronically, too, and includes API No., location, KB, log tops, operator, and status. The Commission also provides a LANDSAT study of Nebraska and northeastern Colorado that includes lineaments and prospect leads. These data were recently converted to vector files and will be provided after the next update. The Commission, while receiving production reports electronically from many operators, also accepts hard copy filings. Software is being developed to allow for the submission of Drilling Permits and Sundry Notices. Nebraska Geological Survey Information, samples, and cores may be accessed in Lincoln from the Nebraska Geological Survey
URL	
State	Nevada

Category	Resource
Citation	
Title	<i>Nevada Bureau of Mines and Geology (NBMG)</i>
Discussion	The Nevada Bureau of Mines and Geology (NBMG) is the research and public service unit of the University of Nevada and does state geological surveys. NBMG scientists conduct research and publish reports on mineral resources, engineering geology, environmental geology, hydrogeology, and geologic mapping.
URL	
State	New York
Category	Resource
Citation	
Title	<i>New York State Energy Research and Development Authority</i>
Discussion	The New York State Energy Research and Development Authority (NYSERDA) was created by the Legislature in 1975 as a public benefit corporation. One goal of NYSERDA's research and development program is to expand the use of indigenous and renewable energy resources. NYSERDA's natural gas agenda has evolved into a multifaceted research and development program structured around the following goals: to help develop new natural gas reserves through innovative exploration methods and reservoir studies; to enhance existing reservoir production by developing or demonstrating new technology and products; to increase natural gas storage from depleted natural gas fields and bedded salt; to improve industry environmental performance; and to conduct extensive industry outreach to educate firms on opportunities for economic production in New York State. Additionally, NYSERDA funds carbon sequestration research.
URL	http://www.nyserda.org/default.asp
State	North Dakota
Category	Resource
Citation	
Title	<i>Commission Website</i>

Discussion	North Dakota provides access to the public via the oil and gas division Website for well files and well data, cores, logs, production and injection volumes, field orders and case files, and streaming audio of cases as they are being held. Witnesses are allowed to provide telephonic testimony at the time the cases are being heard. North Dakota provides electronic submittal of production and injection volumes, permits to drill, and spill reporting.
URL	https://www.dmr.nd.gov/oilgas/
State	Ohio
Category	Resource
Citation	
Title	<i>Ohio Oil and Gas Energy Education Program</i>
Discussion	With the passage of Substitute Senate Bill 46 in December 1997, and the approval of independent producers and royalty owners in a required referendum held in March 1998, the Ohio Oil and Gas Energy Education Program (OOGEEP) became effective on April 1, 1998. OOGEEP is a nonprofit organization and is funded entirely by independent producers and royalty owners through an assessment on the production of all crude oil and natural gas in Ohio. The assessment on crude oil is equal to one cent (\$0.01) per gross barrel and one-tenth of one cent (\$0.001) per gross thousand cubic feet of natural gas. All first purchasers of crude oil and natural gas are required to collect the assessment and submit quarterly payments directly to OOGEEP. The OOGEEP Operating Board consists of six independent producers and one member representing a farmer's organization. As outlined in the Ohio Revised Code, they are appointed by the Ohio Department of Natural Resources, Division of Minerals Resources Management's Technical Advisory Council based upon recommendations from a qualified producers organization and an organization representing farmers, such as the Ohio Oil and Gas Association and the Ohio Farm Bureau.
URL	
State	Ohio
Category	Resource
Citation	Ohio Admin. Code 3750
Title	<i>Ohio State Response Commission: Emergency and Hazardous Chemical Inventory Form</i>

Discussion	In lieu of Ohio oil and gas well owners filing hazardous chemical inventory forms under the Community Right to Know Act SARA title III, the well owners can file well completion and annual production statements with the Division of Mineral Resources Management (DMRM). The well completion and annual statement of production forms were amended to include the number of storage tanks associated with the well and the storage capacity of those tanks. This information, along with detailed well information, can be found on the Division's Website (http://www.Ohiodnr.com/mineral/index.html). Additionally, a link is provided in DMRM's Website to the "Oil and Gas Well Emergency Response System" that was developed with U.S. Department of Energy funding through the Argonne National Lab. This site provides emergency responders with well owner contact phone numbers, emergency officials' phone numbers and site specific information on a well by well basis.
URL	http://codes.ohio.gov/oac/3750
State	Oklahoma
Category	Resource
Citation	
Title	<i>Oklahoma Small Business Linked Deposit Program</i>
Discussion	Operated through the Oklahoma Treasury Department, the program provides low-interest loans to qualifying businesses, including oil-related businesses. Loans can be used for production enhancements, workovers, and other activities that increase compliance, efficiencies and protect the environment.
URL	
State	Oklahoma
Category	Resource
Citation	
Title	<i>Well Inspection Project</i>

Discussion	The Field Operations Department set a goal three years ago to physically inspect every well in Oklahoma within five years. The estimate at that time was approximately 130,000 wells, which appears to have been too low. As of July 1, 2009, Field Operations had inspected 93,605 wells and, according to records, there are 190,440 left to inspect. However, the department believes that number to be erroneous because records haven't been updated in a timely fashion. In many cases, no well was found at the location because it had been plugged years ago but not entered into the database. As each well is inspected, the GPS reading, well status and type are entered into a spreadsheet which is stored on a portable hard drive for later use in updating the database. It has been determined that many wells had been entered multiple times, causing the database to be incorrect.
URL	
State	Pennsylvania
Category	Resource
Citation	
Title	<i>Well Production Data</i>
Discussion	Pennsylvania regulators are working to change their laws concerning well production data, mud logs, and other information gathered from oil and gas producers. They are using examples from other producing states such as Texas and Oklahoma to show that posting this data will spur business development because operators are more likely to commit the millions of dollars necessary for exploration when they have this information in advance.
URL	
State	Texas
Category	Resource
Citation	
Title	<i>Commission Website</i>

Discussion	The Railroad Commission of Texas is integrating its geographic information systems (GIS), business applications, and electronic images of documents. From the GIS Public Viewer, the Commission has established links to allow the public to view oil and gas well attributes, permit information, production data, and well log and completion packet document images. From this foundation, the Commission provides users with flexible access to information and services. Data available from the Texas site include: Drilling Permit Application Query Oil and Gas Proration Schedules Listed by Operator, Gatherer, Purchaser and Field Oil Production and Well Counts Production Adjustment Factor: Each month the Commission reports preliminary Texas production of crude oil and gas based on producer filings of Form PR. Preliminary production totals are key indicators for many industry analysts, who use the data to forecast U. S. oil and natural gas supply and demand and to measure industry activity and performance. Public GIS Map Viewer for Oil, Gas, and Pipeline Data: The Commission's Public GIS Map Viewer for Oil, Gas, and Pipeline Data combines detailed information and location coordinates for oil wells, gas wells, and pipelines from the Railroad Commission's files with base map data from the U.S. Geological Survey 7.5 minute quadrangle maps. These interactive maps were developed using Environmental Systems Research Institute, Inc. (ESRI) ArcIMS software, and they interface with the Commission's Production Data Query Well Logs List for the Public GIS Map Viewer for Oil, Gas and Pipeline Data: The Railroad Commission began scanning well logs in June 2004. Images of all well logs filed with the Commission on or after June 2004 to satisfy the requirements of 16 TAC § 3.16 (Statewide Rule 16) are available through the Website. Drilling Permit (W-1) Subscriptions: Information concerning well records, well counts, distribution tables and by county data are available, as are links to other well-related information.
URL	http://www.rrc.state.tx.us/data/index.php
State	Utah
Category	Resource
Citation	
Title	<i>Utah Geological Survey</i>
Discussion	The Utah Geological Survey provides valuable technical publications on oil and gas reserves and also operates the Utah Core Research Center in a 12,000-foot warehouse.
URL	

State	Utah
Category	Resource
Citation	
Title	<i>ePermit</i>
Discussion	The Division of Oil, Gas and Mining has electronic permitting of oil and gas wells and electronic sundry notice approval available to well operators. DOGM's Website is highly regarded for access to oil and gas statistics and detailed well information and logs on the Internet.
URL	http://oilgas.ogm.utah.gov/Quick_Refs/qref_permits.htm
State	Virginia
Category	Resource
Citation	
Title	<i>Data Information System</i>
Discussion	The Virginia Division of Mineral Resources conducts research and provides information about the state's gas and oil resources for the gas and oil industry. The division maintains all information on coreholes, geologic features in gas and oil bearing areas, and a database on wells drilled in the Commonwealth.
URL	
State	West Virginia
Category	Resource
Citation	
Title	<i>Water Withdrawal from West Virginia Streams Guidance</i>
Discussion	This application, available on the Department of Environmental Protection webpage, provides oil and gas operators with real-time information for withdrawing water from a stream in an environmentally safe manner.
URL	http://gisonline.dep.wv.gov/wwt/index.html
State	West Virginia

Category	Resource
Citation	
Title	<i>WV DEP Resource Extraction Data Viewer -- RIA to View Oil and Gas Wells Data</i>
Discussion	This application, available on the Department of Environmental Protection webpage, presents permit information as well as location coordinates for oil wells, gas wells, and underground mine boundaries throughout the state of West Virginia. The application uses base map data from the U.S. Geological Survey (7.5 minute quadrangle maps) and 2007 aerial imagery with one meter resolution.
URL	http://gisonline.dep.wv.gov/fogm/index.html

In addition to data and information access, individual states have implemented laws and regulations to aid in the regulatory streamlining process.

Table 2. Regulatory Streamlining Laws and Regulations

Regulatory Streamlining

A thoughtful process of making regulations and compliance simpler, saving money for both government and the regulated community, all without decreasing regulatory effectiveness. Streamlining is a constant process that evolves with technology, modernized business practices, government capacity and emerging regulatory needs. (IOGCC)

State	Alabama
Category	Laws and Regulation
Citation	Ala. Code § 9-17-33
Title	<i>Disposition of proceeds derived from sale of oil or gas producti</i>

Discussion	Increases the minimum royalty payment threshold to \$100
URL	
State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § A-8
Title	<i>Reporting Requirements for Mineral Proceeds Escrow Accounts</i>
Discussion	The new rule establishes specific requirements for reporting of funds held for the benefit of unknown or unlocatable mineral owners. The requirements: *Must hold funds in an account with a bank licensed to do business in Arkansas. *Must file an annual report detailing the following: name and address of owner; legal description of property interest; location of number of account; persons authorized to withdraw from account; and whatever information the AOGC may require. The report is to be filed by February 1 every year, and there will be a civil penalty of up to \$1,000 for each violation.
URL	
State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § B-11
Title	<i>Natural Gas or Fresh Water Supply Wells for Domestic Use</i>
Discussion	This new rule provides methodology for the transfer of natural gas production wells to landowners for domestic use purposes. Production may be used only on property where the well is located. Written agreement from all owners must be filed. the rule provides methodology for the transfer of natural gas or oil production wells to landowners for use as domestic water supply wells.
URL	
State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § B-40

Title	<i>Administrative Approval of Exceptional Locations</i>
Discussion	The amendment allows administrative approval for wells that have been drilled, but prior to commencement of production. If administrative application is denied, the applicant may request a hearing in accordance with A-2 and A-3, except that no additional fee is required. It authorizes administrative approval for sharing an exceptionally located well between two or more integrated drilling units, which are held by production, based upon any “calculated area” (shape) that all working interest owners in all units agree upon. The director has discretion to refer the application to the Commission for a hearing.
URL	
State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § D-17
Title	<i>Regulation of Natural Gas Pipelines</i>
Discussion	This amendment clarifies that Arkansas Oil and Gas Commission (AOGC) jurisdiction includes all types of pipelines upstream of custody transfer, not just type gathering lines. It exempts pipeline systems less than 1 mile in length, and which do not cross public roads, railroads, or perennial streams from paying the permit fee. It also establishes requirements for lines not subject to federal regulation; clarifies incorporation of federal construction, operation, and maintenance requirements into state regulation; And specifies additional requirements for pipelines containing Hydrogen Sulfide.
URL	
State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § E-3
Title	<i>Exploration and Production Fluid Handling and Transportation</i>
Discussion	The new rule requires each “transporter” using motor vehicles to transport exploration and production fluid (excludes fresh water) to be permitted. Each transporter is required to submit a Form 1 Organization Report, and a Form 32, along with applicable application fee (\$100 per tank). A permit sticker is to be placed at the rear of each transportation tank. Each transporter shall be in compliance with this rule by March 30, 2009. Manifests must be maintained to show produced fluids received, transporter, delivery, and disposal.
URL	

State	California
Category	Laws and Regulation
Citation	AB 1234
Title	<i>Transfer of Pipeline Right of Way</i>
Discussion	This law allows a utility to transfer easements and right of ways associated with a section of gathering pipeline to an individual producer or a cooperative of producers.
URL	
State	California
Category	Laws and Regulation
Citation	AB 1960
Title	<i>Article 4.4 Regulation of Production Facilities</i>
Discussion	New legislation was passed giving the California Division of Oil, Gas, and Geothermal Resources (DOGGR) specific authority to regulate oilfield production facilities. DOGGR did not have this specific authority until now.
URL	
State	Colorado
Category	Laws and Regulation
Citation	
Title	<i>New Rule Development</i>
Discussion	Colorado promulgated new rules and procedures effective May 1, 2009, to address increases in oil and gas activity in the state. In 2007, upon the urging and initiative of the Colorado Department of Natural Resources, the General Assembly passed legislation to increase the Commission's regulatory authority and oversight obligations to better address the potential adverse impacts that can accompany oil and gas development. The General Assembly declared that it is in the public's interest to foster the responsible, balanced development of Colorado's oil and gas resources consistent with the protection of public health, safety, and welfare, including protection of the environment and wildlife resources. C.R.S. § 34-60-102(1). (cogcc.state.co.us). Read the IOGCC case study later in this chapter

URL	
State	Kansas
Category	Laws and Regulation
Citation	Kan. Stat. Ann. § 55-1624
Title	<i>FERC-Ordered Refunds of Tax Reimbursements; Recovery</i>
Discussion	Royalty Interests, Statute of Limitations on FERC-Ordered Refunds. The period of time during which first sellers of natural gas could commence a civil action against royalty interest owners to obtain refunds of reimbursements for ad valorem taxes on royalty interests during the years 1983 through 1988 was declared expired and the refund claims were deemed to be uncollectible. The legislature reaffirmed that the Kansas five-year statute of limitations found in K.S.A. 60-511 applied to these claims created when the Federal Energy Regulatory Commission (FERC), more than 15 years after its initial determination, reversed its long-standing policy that the Kansas ad valorem tax, which was based on production, was a severance tax and could be added to the maximum lawful price set by the NGPA at that time. FERC ordered first sellers to refund the amount of the ad valorem tax. This statute and that part of the FERC order relating to penalty and interest is under court challenge in both state and federal courts.
URL	
State	Louisiana
Category	Laws and Regulation
Citation	
Title	<i>New Safety Rules Issued</i>
Discussion	In a January 12, 2009, press release, Louisiana Commissioner of Conservation James H. Welsh issued two new permanent rules and a new policy that combine to give Louisiana some of the most stringent oil and gas drilling safety rules in the country. The new permanent rules, which were effective as of Dec. 20, 2008, track the federal government's requirements on the drilling it regulates, and, as of January 12, a new office policy bans wells within 1,000 feet of the crossing of Interstate highways over major waterways. The 1,000-foot ban includes such areas as the I-10 crossing of the Sabine River, Calcasieu River, Atchafalaya Basin, Mississippi River, Lake Pontchartrain and Pearl River; the I-12 crossing of the Amite River; and the I-20 crossing of the Red, Ouachita, Tensas and Mississippi rivers, among others. Most oil and gas producing states have no rules addressing distance between oil and gas drilling operations and roadways, and the few that do require no more

	than a 100-foot distance. One of the rules places many new requirements on well operators to ensure the proper design, testing, and use of blowout preventers and diverters, as well as new requirements for the quick operation of valves controlling in-pipe gas and fluid flow. The rule also requires operators to ensure that employees of contracted drilling companies receive recurring training on well control practices and establish procedures to ensure employees retain the knowledge, skill, and competency to perform their well control duties. These safety rules were developed after extensive study by the Louisiana Department of Natural Resources' Office of Conservation and the Commissioner's Ad Hoc Committee on Drilling Safety. The committee included representatives from the state, the oil and gas industry, and landowner interests. http://dnr.louisiana.gov/cons/memos/memo20090112-well-location-policy-interstates.pdf
URL	http://dnr.louisiana.gov/cons/rules200812.pdf
State	Louisiana
Category	Laws and Regulation
Citation	Louisiana HB 159 - 2009 Regular Session (Act 126)
Title	<i>An act to amend and reenact R.S. 30:28(B), relative to drilling permits; to provide for the validity of drilling permits; and to provide for related matters.</i>
Discussion	Effective August 15, 2009, under Act 126 of the 2009 Regular Session, an operator can acquire a permit to drill with a one-year term (period of validity) as opposed to the traditional 180-day term. Both terms, the traditional 180-day permit and the one-year permit will be valid options. The associated fees for each category of the traditional 180-day permit will double for the one-year permit option.
URL	
State	Nevada
Category	Laws and Regulation
Citation	Nev. Admin.Code § 522.040
Title	<i>Permits to Drill Wells Required; Fees</i>
Discussion	See Nev. Admin.Code § 522.150
URL	http://www.leg.state.nv.us/NRS/NRS-522.html#http://www.leg.state.nv.us/NRS/NRS-522.html#NRS522Sec040
State	Nevada

Category	Laws and Regulation
Citation	Nev. Admin.Code § 522.050
Title	<i>Payment of Expenses for IOGCC; Administrative Fee</i>
Discussion	See Nev. Admin.Code § 522.150
URL	http://www.leg.state.nv.us/NRS/NRS-522.html#NRS522Sec050
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann § 1509.03
Title	<i>Administrative Rules</i>
Discussion	See Ohio Rev. Code Ann. §1509.02
URL	http://codes.ohio.gov/orc/1509.02#http://codes.ohio.gov/orc/1509.03
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann § 1509.06
Title	<i>Application for Permit to Drill, Reopen, Convert, or Plug Back a Well</i>
Discussion	See Ohio Rev. Code Ann. §1509.02
URL	http://codes.ohio.gov/orc/1509.03
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann § 1509.23
Title	<i>Health and Safety Rules for Drilling of Wells and Production of Oil and Gas</i>
Discussion	See Ohio Rev. Code Ann. §1509.02
URL	http://codes.ohio.gov/orc/1509.23
State	Ohio

Category	Laws and Regulation
Citation	Ohio Rev. Code Ann § 1509.31
Title	<i>Notice to Holder of Royalty Interest of Assignment or Transfer of Entire Interest in Lease</i>
Discussion	See Ohio Rev. Code Ann. §1509.02
URL	http://codes.ohio.gov/orc/1509.31
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann. § 1509.02
Title	<i>Division of mineral resources management</i>
Discussion	Division of Mineral Resources Management. Under House bills 278 and 279, Ohio Revised Code Sections 1509.02, 1509.03, 1509.06, 1509.23 and 1509.31 were amended and 1509.39 was repealed. The amendments and repeal provided for the Division of Mineral Resources Management to be the sole and exclusive authority to regulate the permitting, location, and spacing of oil and gas wells in Ohio. The House bills created the Oil and Gas Advisory Council, which advised the chief on rules drafted pursuant to the enactment of the bills. Public hearings were held on the draft rules in June and July of 2005 with the effective date of the rules in August 2005. The rules provide more authority for the chief in the areas of safety during the drilling and production of oil and gas wells, protection of groundwater resources and environmental protection for wells drilled in “urbanized areas” (all municipal corporations and any township with an unincorporated population exceeding 5,000).
URL	http://codes.ohio.gov/orc/1509.02
State	Oregon
Category	Tax Incentive
Citation	Or. Rev. Stat. § 324.090(1)
Title	<i>14.002 State and Local Interests</i>
Discussion	Any royalty or other interest in oil or gas owned by the state or local government is exempt from the oil and gas severance tax.
URL	
State	Oregon

Category	Tax Incentive
Citation	Or. Rev. Stat. § 324.090(2)
Title	<i>14.003 Credit for Property Taxes Paid</i>
Discussion	A credit is allowed against the oil and gas severance tax for all property taxes imposed. This includes taxes on any property rights attached to the right to produce oil and gas, producing oil and gas leases, and machinery and equipment used in the operation of the well.
URL	
State	Pennsylvania
Category	Tax incentive
Citation	73 P.S. § 2260.101 et. Seq.
Title	<i>Regulatory Electronic Transactions</i>
Discussion	Electronic Transactions Act. In December of 1999 the Pennsylvania Legislature passed this version of the Uniform Electronic Transactions Act. This legislation can be considered an incentive in that it allows for the electronic submission of permit applications and required reports.
URL	
State	South Dakota
Category	Laws and Regulation
Citation	S.D. Codified Laws § 45-9-40
Title	<i>Order of board for unit operation of a pool the percentage of owners required to ratify an oil and gas unit</i>
Discussion	To encourage more exploration and increase production of oil and gas resources in South Dakota while protecting all owners' rights and preventing the drilling of unnecessary wells, the South Dakota Legislature approved, and Governor Rounds signed HB1014. The statute, 45-9-40, took effect July 1, 2004.
URL	http://legis.state.sd.us/sessions/2004/bills/HB1014enr.pdf
State	Texas
Category	Laws and Regulation

Citation	
Title	<i>Severance Tax Administration</i>
Discussion	Removal of accelerated biennial due date (“speed up”) for natural gas severance taxes and penalties for speeding up late payments. Eliminates early payment of natural gas tax in odd-numbered years. Agency: Comptroller of Public Accounts.
URL	
State	Texas
Category	Tax incentive
Citation	Tex. Nat. Res. Code Ann. § 91.402(d)
Title	<i>Time for Payment of Proceeds</i>
Discussion	Producers may delay payment of royalties until they reach a total of \$100 or 12 months proceeds have accumulated, whichever comes first. Annual reporting for the lease may not exceed \$3,000. This corresponds to HB 1593.
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.91.htm#91.402

Permitting and Reporting Processes

Permitting and compliance are necessary for the protection of the public’s health, safety, and natural environment. Permitting and compliance mean much more than “checking a box” -- they require a discourse between the operator and regulatory agencies.

The permitting process can be either very simple or very complex depending upon a number of variables. One example is the setting of the proposed operations – Operators and regulators must ask a number of questions before determining the permits required. Is the location rural or urban? Is it on federal land? Is there a requirement for an environmental impact analysis? Are municipal rules applicable? Are there any environmental issues? Will additional infrastructure – such as electric power lines, roads, and pipelines – need to be installed?

Another important variable is the type of technology being employed. What water use, treatment, and disposal methodologies will be necessary for the technology? Are there specific construction requirements?

The level of complexity requires more inter-agency communication. Not only will the operator need to talk to the state's oil and gas regulatory agency, but the operator may also need to talk to the state's transportation department, the state's department of environmental quality, the property owners on whose surface drilling operations will be conducted, the state and district courts, and many other agencies that might have an interest in the drilling operations.

In addition to conversations with these stakeholders, there are regulatory processes that the operator must go through before a permit will be issued. There might be a NEPA-style analysis that the operator has to conduct or there might be a municipal authority that needs to be informed or there might be a concerned citizen's group that needs to be assuaged.

Oil and gas drilling potentially could require many different permits from many different agencies. The permit from the oil and gas regulatory agency is just one of many that operators may be required to have to begin drilling operations. Streamlining the permitting process reduces regulatory redundancies and ensures that the interests of the various state agencies and individuals are protected and addressed, not lost in a morass of paperwork or suffering from a lack of oversight. Streamlining the permitting process allows drilling operations to commence sooner, facilitating the payment of royalties to owners, thereby increasing the tax revenue for the states.

In 2005, the federal government began streamlining the permitting process for drilling on federal lands. Section 365 of the Energy Policy Act of 2005 established the Federal Permit Streamlining Project aimed at improving the coordination of oil and gas permitting on federal lands. The pilot project to improve federal permit coordination has set-up field offices in Wyoming, Montana, New Mexico, Colorado, and Utah. The pilot offices are the laboratories for the project, finding ways to better coordinate permitting allowing for the efficient development and the inspection and enforcement that helps protect the environment. To ensure stakeholder enfranchisement, a memorandum of understanding between the Bureau of Land Management (BLM), the Bureau of Indian Affairs, the Bureau of Reclamation, the U.S. Fish and Wildlife Service, the U.S. Department of Agriculture – Forest Service, the Environmental Protection Agency, and the Army Corps of Engineers allows for these interconnected agencies to staff the pilot project offices with specialists in various aspects of permit

review, inspection, and enforcement. The Energy Policy Act also allows for state agencies to have a role in the pilot project.

In the second year, the pilot project was shown to be a success in implementing the BLM's efforts to streamline the processing of oil and gas drilling permits while also improving environmental and resource stewardship. During 2007, the BLM's streamlining efforts allowed for the number of applications for permits to drill to increase by 10% compared to the number of applications for permits to drill processed in 2005. Improved processing allowed the pilot offices to reduce the backlog of applications for permits to drill. Further, the BLM streamlining allowed an increase in inspection and enforcement actions, with the pilot offices performing 24% more inspections in 2007 than in 2006 and 48% more than in 2005. The number of environmental inspections was also 78% higher in 2007 than in the previous year (BLM process).

The BLM's pilot permitting project is a good example of the positive effect of regulatory streamlining. By setting up regional offices and fostering working relationships with different agencies through the memorandum of understanding, the BLM is improving access to federal lands while at the same time ensuring responsible, environmentally conscious development. The BLM's pilot project should serve as an example for the states. By bringing seemingly disparate stakeholders with differing missions into the fold, the BLM has been able to have effective, single-layer communication allowing for quicker permitting, more compliance, and greater oversight.

The permitting process is the first of many regulatory hurdles. Streamlining the permitting process improves the overall regulatory process, driving down costs for all stakeholders. Keeping regulatory costs at a minimum is especially important for the smaller producers who make up the greatest portion of the domestic oil and gas industry. By decreasing the number of regulatory holders and by engaging all stakeholders on the same level, the permitting process would be streamlined, keeping costs down, supporting production, and ensuring compliance and environmental protection.

Because the permitting process requires a comprehensive evaluation process, including site visits and site-specific evaluations, it is doubtful that the entire permitting process can ever be 100% electronic. However, many states have instituted some form of electronic permitting and reporting processes.

The Kansas Corporation Commission (KCC) has been working with the University of Kansas on a website application that eventually will link operations between the Kansas Geological Society, the Department of Revenue, county appraisers, and the KCC. Operators can create their own account online that they can use to file for drilling permits, check the status of applications, report revenues, and other tasks that once required paper and a trip to the office. The project, which Kansas calls SOLAR for Simplified On-Line Automated Reporting, has been extremely successful. Implemented in the spring of 2008, the program was receiving half of the permit applications online by September. According to Doug Louis, Director of the KCC Conservation Division, the success lies in careful beta-testing to work out glitches before the roll-out of the product. Louis says that the system cuts down on the number of calls that office personnel must handle. Another benefit is accuracy; SOLAR has a built-in “dummy check” that will not allow a permit application to go forward online if the location does not match a location on the system.

In Louisiana, online production reporting, well database access (the “SONRIS” system), GIS Interactive Map system, and a wide variety and large quantity of information are available through the Office of Conservation’s website.

The Michigan Office of Geological Survey offers electronic submittal of hydrocarbon production reporting as well as downloads and other information.

The Nebraska Oil and Gas Conservation Commission receives production reports electronically from many operators. Software is under development to allow submission of Drilling Permits and Sundry Notices.

North Dakota provides access to the public via the Oil and Gas Division website for well files and well data, cores, logs, production and injection volumes, field orders and case files, and streaming audio of cases as they are being held. Witnesses are allowed to provide telephonic testimony at the time the cases are being heard. North Dakota provides electronic submittal of production and injection volumes, permits to drill, and spill reporting.

In lieu of Ohio oil and gas well owners filing hazardous chemical inventory forms under the Community Right to Know Act Superfund Amendments and Reauthorization Act (SARA) title III, they can file well completion and annual production statements with the Division of Mineral Resources Management (DMRM). The well completion and annual statement of production forms were amended

to include the number of storage tanks associated with the well and the storage capacity of those tanks. This information, along with detailed well information, can be found on the division's website

South Dakota's "One Stop Permitting" program offers publications that give an overview of permitting processes and regulations. *The Environmental Permitting Guide* provides comprehensive listings of department permits, flow charts, and staff contacts. The *Environmental Permitting Summary* provides a listing of all department permits, a brief description of each permit, duration of permits and permit costs. (South Dakota Department of Environment & Natural Resources)

In Utah, the Division of Oil, Gas and Mining has electronic permitting of oil and gas wells and electronic sundry notice approval available to well operators. DOGM's website is highly regarded for access to oil and gas statistics and detailed well information and logs on the Internet.

Wyoming Encourages Operators to Try Electronic Permitting

The Wyoming Oil and Gas Conservation Commission is increasing the number of oil and gas operators that utilize electronic reporting of oil and gas production and sales. Currently, the state is working with a select group of operators to electronically file conservation taxes. Wyoming is encouraged by the efforts to date and anticipates expansion of electronic filing of conservation taxes to a larger group of operators in late 2010. (IOGCC, 2008)

Table 3. 2008 Permits Issued by State – Oil Wells

ST	Oil Wells					
	Active	Inactive	Permitted	P&A	Production	Sales
ALABAMA	577	359	44	31	7,689,547	
ALASKA	2,054	686	144	80	249,873,742	233,620,021
ARIZONA	15	15	0	0	51,575	51,575
ARKANSAS	6,941	771	152	69	5,913,563 ¹	5,913,563

¹ Marked "N/A" on survey; Entered sales figures as an estimate for comparison purposes only

ST	Oil Wells					
	Active	Inactive	Permitted	P&A	Production	Sales
CALIFORNIA	52,540	20,768	2,885	1,490	238,607,976	238,607,976
COLORADO						
FLORIDA	61	43	8	2	1,955,521	1,955,521 ²
GEORGIA	0	0	0	0	0	0
IDAHO	0	1	0	0	0	0
ILLINOIS	26,000	6,500	625	609	9,500,000	9,500,000 ³
INDIANA	3,465	1,119	220	251	1,858,311	1,858,311 ⁴
KANSAS	52,644	4,323	1,621	754	39,586,000	39,586,000
KENTUCKY	26,107	4,990	1,153	489	2,645,193 ⁵	2,645,193
LOUISIANA	20,680	11,221	564 ⁶	77	72,633,561	72,633,561 ⁷
MARYLAND	0	0	0	0	0	0
MICHIGAN	3,674	470	296	71	5,720,463	5,720,463
MISSOURI	458	152	169	6	98,927	98,927
MISSISSIPPI	3,093		168	24	20,533,771	20,491,585
MONTANA	4,468	2,400	199	67	31,538,900	31,505,100
NEBRASKA	1,207	311	93	20	2,393,504	2,389,696
NEVADA	75	21	13	2	436,271	436,271
NEW MEXICO	20,669	2,074	1,277	331	60,167,768	59,805,772
NEW YORK	3,617	1,527	250	105	397,060	397,060
NORTH CAROLINA						
NORTH DAKOTA	4,281	516	937	81	62,776,123	62,365,832
OHIO	26,156	2,388	476	197	5,554,235	5,554,235
OKLAHOMA	83,443 ⁸	N/A	2,126 ⁹	679	65,268,490 ¹⁰	65,268,490
OREGON						

² "Sales" not reported; production entered as an estimate for comparison purposes only

³ "Sales" not reported; production entered as an estimate for comparison purposes only

⁴ "Sales" left blank; production entered as an estimate for comparison purposes only

⁵ "Production" was not reported; "Sales" figure entered as an estimate for comparison purposes only

⁶ 192 were permitted for gas or oil in LA

⁷ Listed as "unavailable"; "Production" figures entered for comparison purposes only

⁸ Estimate

⁹ Well permit data includes oil and gas; 6,039 total permits issued; wells permitted is estimated based on the ratio of oil wells completed and gas wells completed in the year of 2008 for comparison only

¹⁰ "Production" was not reported; "Sales" figure entered as an estimate for comparison purposes only

	Oil Wells					
ST	Active	Inactive	Permitted	P&A	Production	Sales
PENNSYLVANIA	19,093	28	1,973	140	3,600,000	3,600,000 ¹¹
SOUTH CAROLINA	0	0	0	0	0	0
SOUTH DAKOTA	162	14	27	3	1,696,792	1,696,792
TENNESSEE						
TEXAS	156,588	103,637	4,736	3,855	352,628,026	352,572,524
UTAH	3,016	812	435	41	22,009,732	21,772,995
VIRGINIA	3	8	0	0	15,712	15,712 ¹²
WASHINGTON						
WEST VIRGINIA	3,957	740	186 ¹³	13	1,184,580	1,184,580 ¹⁴
WYOMING	11,543	3,457	489	223	52,952,216	52,534,128
	Oil Wells					
CANADIAN AFFILIATES	Active	Inactive	Permitted	P&A	Production	Sales
Alberta	42,559	25,170	2,989	1,703 ¹⁵	661,710,000	624,859,000
British Columbia						
Newfoundland/Labrador	58	14	8	9	125,245,251	125,245,251 ¹⁶
Nova Scotia						
Saskatchewan						
Yukon	0	3	0	0	0	0

Table 4. 2008 Permits Issued by State -- Natural Gas

	Natural Gas Wells					
ST	Active	Inactive	Permitted	P&A	Production	Sales
ALABAMA	6,539	206	397	107	279,450,843	237,800,628
ALASKA	170	75	30	2	151,304,314	121,591,569
ARIZONA	6	2	0	0	523,130	503,037
ARKANSAS	5,538	409	1,388	50	449,901,336 ¹⁷	449,901,336

¹¹ Listed as "not tracked;" "Production" figures entered for comparison purposes only

¹² "Sales" not reported; production entered as an estimate for comparison purposes only

¹³ Well permit data includes oil and gas; 2,577 total permits issued; wells permitted is estimated based on the ratio of active oil wells to active natural gas wells

¹⁴ "Sales" not reported; production entered as an estimate for comparison purposes only

¹⁵ Total all wells abandoned, excludes oil sands evaluation wells

¹⁶ "Sales" not reported; production entered as an estimate for comparison purposes only

¹⁷ Marked "N/A" on survey; Entered sales figures as an estimate for comparison purposes only

ST	Natural Gas Wells					
	Active	Inactive	Permitted	P&A	Production	Sales
CALIFORNIA	1,654	795	230	100	296,949,914	232,260,804
COLORADO						
FLORIDA	0	0	0	0	2,835,069	2,835,069 ¹⁸
GEORGIA	0	0	0	0	0	0
IDAHO	0	0	0	0	0	0
ILLINOIS	349	80	32	4		
INDIANA	740	271	126	24	4,701,382	4,701,382 ¹⁹
KANSAS	25,185	2,003	1,581	201	377,386,000	377,386,000
KENTUCKY	18,905	3,650	566	40	114,116,089 ²⁰	114,116,089
LOUISIANA	19,441	5,136	1,571 ²¹	65	1,360,213,375	1,350,250,922
MARYLAND	7	0	0	0	49,541	7
MICHIGAN	10,665	238	595	21	158,309,319	158,309,319
MISSOURI	12	18	0	0	5,830	5,830
MISSISSIPPI	1,787		236	34	100,789,238	98,844,390
MONTANA	6,544	1,000	495	188	119,571,800	108,456,300
NEBRASKA	301	61	230	5	2,835,409	2,618,071
NEVADA	0	0	0	0	4,177	4,177 ²²
NEW MEXICO	27,592	625	967	241	1,457,217,237	1,400,498,209
NEW YORK	6,675	912	429	16	50,319,577	49,632,952
NORTH CAROLINA						
NORTH DAKOTA	223	10	6	2	87,192,320	56,727,957
OHIO	28,219	4,775	952	295	84,858,015	84,858,015
OKLAHOMA	41,921	6,198	3,913 ²³	403	1,734,285,220 ²⁴	1,734,285,220
OREGON						
PENNSYLVANIA	55,681	142	5,951	252	198,295,000	198,295,000 ²⁵

¹⁸ "Sales" not reported; production entered as an estimate for comparison purposes only

¹⁹ "Sales" not reported; production numbers entered as an estimate

²⁰ "Production" was not reported; "Sales" figure entered as an estimate for comparison purposes only

²¹ 192 were permitted for gas or oil in LA

²² "Sales" not reported; "production figures entered as an estimate for comparison purposes only

²³ Well permit data includes oil and gas; 6,039 total permits issued; wells permitted is estimated based on the ratio of oil wells completed and gas wells completed in the year of 2008 for comparison onl

²⁴ "Production" was not reported; "Sales" figure entered as an estimate for comparison purposes only

²⁵ Listed as "not tracked;" "Production" figures entered for comparison purposes only

	Natural Gas Wells					
ST	Active	Inactive	Permitted	P&A	Production	Sales
SOUTH CAROLINA	0	0	0	0	0	0
SOUTH DAKOTA	81	6	28	3	10,908,621 ²⁶	1,098,427
TENNESSEE						
TEXAS	96,502	30,773	5,523	1,636	7,048,187,667	6,831,533,324
UTAH	5,578	987	917	65	442,326,878	401,925,000
VIRGINIA	6,426				128,454,245	128,454,245 ²⁷
WASHINGTON						
WEST VIRGINIA	50,965	11,070	2,391 ²⁸	236	245,056,123	245,056,123 ²⁹
WYOMING	31,256	10,671	7,138	494	2,489,166,803	2,287,931,982
	Natural Gas Wells					
CANADIAN AFFILIATES	Active	Inactive	Permitted	P&A	Production	Sales
Alberta	111,815	29,206	7,851		4,723,200,000	4,723,200,000
British Columbia						
Newfoundland/Labrador	0	0	0	0	0	0
Nova Scotia						
Saskatchewan						
Yukon	2	2	0	0	2,678,313	1,865,683

Inter-State- and Intra-State Collaboration

Perhaps one of the greatest opportunities and challenges faced by regulatory authorities is communicating and working with other regulatory agencies. Interface occurs between federal and state regulatory agencies, as well as between agencies and departments at the state level. When regulatory agencies work together, permitting and compliance processes can become simpler, easier to manage, and more efficient. By coming together and sharing lessons learned and success stories, regulatory agencies can adapt and adjust new ideas and innovative practices to meet their needs. The IOGCC

²⁶ Saleable gas; the total volume is large because of the high volumes of air injected and produced back to operate the 3 in situ combustion units in Buffalo Field

²⁷ "Sales" not reported; production entered as an estimate for comparison purposes only

²⁸ Well permit data includes oil and gas; 2,577 total permits issued; wells permitted is estimated based on the ratio of active oil wells to active natural gas wells

RE²⁹ "Sales" not reported; production entered as an estimate for comparison purposes only

continues to act as a forum for interagency collaboration by bringing together federal and state legislators and regulators, industry representatives, and other stakeholders.

Representatives are appointed to the IOGCC from applicable federal agencies, including the DOE, the Department of the Interior (DOI), the EPA and FERC. These federal representatives attend IOGCC meetings; participate in IOGCC committees and workgroups and contribute to IOGCC special projects.

IOGCC's Council of State Regulating Officials (CSRO) is comprised of one representative from each oil and gas regulatory agency. Members of the council meet biannually to discuss regulatory issues of mutual interest, and often develop best practices for regulatory oversight. Using the IOGCC as a medium, regulatory officials will frequently poll other members of the CSRO about issues and challenges they face, enabling them to quickly evaluate options for their states.

The IOGCC/EPA MOU Task Force was formed as a result of a memorandum of understanding between the IOGCC and the EPA. IOGCC member governors appointed representatives from their states while the EPA appointed decision-level headquarters administrators to the Task Force. IOGCC representatives identify issues that they believe need attention for negotiation with the EPA team. More recently, the IOGCC has formed an IOGCC/FERC MOU Task Force and IOGCC/DOE MOU Task Force based upon this successful model.

The IOGCC also collaborates with a variety of organizations to address common issues. Examples of such collaborative organizations include the Environmental Council of the States (ECOS), the Ground Water Protection Council (GWPC), National Association of Regulatory Utility Commissioners (NARUC), the Southern States Energy Board (SSEB), and the State Review of Oil and Natural Gas Regulations (STRONGER)

Similar to the CSRO, ECOS is a national, non-partisan association of the state environmental officials. ECOS holds regular meetings, drafts resolutions, and shares best practices, successes, and lessons-learned. Many CSRO members attend and participate in ECOS.

The GWPC is a nonprofit (501(c)6) organization whose members consist of state ground water regulatory agencies. The GWPC promotes the use of best management practices and fair but effective laws regarding comprehensive ground water protection (Ground Water Protection Council).

SSEB is a non-profit interstate compact organization created in 1960 and established under Public Laws 87-563 and 92-440. Sixteen southern states and two territories comprise the membership of SSEB:

Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, Puerto Rico, South Carolina, Tennessee, Texas, U.S. Virgin Islands, Virginia and West Virginia. Each jurisdiction is represented by the governor and a legislator from the House and Senate. (Board).

STRONGER is a non-profit, multi-stakeholder organization whose purpose is to assist states in documenting the environmental regulations associated with the exploration, development and production of crude oil and natural gas. The review method is a collaborative process by which teams composed of stakeholders from the oil and gas industry, state environmental regulatory programs, and members of environmental/public interest communities critique state oil and gas waste management programs against a set of guidelines developed and agreed to by the participating parties. Since its initiation, the process has completed reviews of 17 state programs responsible for the regulation of more than 85% of the domestic onshore production of oil and natural gas (STRONGER).

NARUC is an association representing the state public service commissioners who regulate essential utility services such as electricity, gas, telecommunications, water, and transportation.

Many times, informal and formal collaborative partnerships are formed at the state level between regulatory agencies, industry representatives, local universities, workforce agencies, and community representatives. The IOGCC recently collaborated with the University of Pennsylvania to plan and implement the 2009 Pennsylvania Natural Gas Summit. Industry, regulatory officials, educational institutions, municipalities, and environmental groups came together to discuss water and infrastructure issues in the Marcellus Shale. With more than 400 participants, the summit was considered a success and an example of how regional collaboration can address area issues and challenges as they arise.

Chapter 2. Resource Management

The citizens of our nation entrust elected officials and regulatory authorities with managing the environment of the communities they serve. Regulators are tasked with balancing protection of the environment with economic factors, health and safety requirements, education, physical comfort, access to utilities, transportation, national security and other factors to protect, preserve, and enhance the nation's standard of living.

Resource management incorporates the interrelated components of conservation of natural resources, environmental protection, economic stimulation, and health and safety. Woven throughout the regulatory environment is the principle of the 10th Amendment of the United States Constitution, commonly referred to as "states rights."

The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people. (US Const., amend X)

State regulatory authorities achieve resource management through laws and regulations that reflect the local conditions and needs of individual states. In general, regulators prefer utilizing an approach that encourages operators to do more than just follow the rules, but rather go above and beyond to improve local communities holistically. They do this by:

- Encouraging new production frontiers and increased production
- Encouraging production enhancements, efficiency improvements, and new technology usage
- Advocating the use of "cutting edge" waste management practices
- Encouraging reduction and re-use of materials
- Encouraging and promoting comprehensive drill plans that incorporate long- and short-term planning, community involvement, and environmental stewardship

IOGCC Resource Management Philosophy

The IOGCC has long advocated for the conservation of our nation's natural resources. The IOGCC's Carbon Capture and Geologic Storage Task Force, when developing its model CCGS

regulations, coined the term “resource management” to describe its philosophy regarding CO₂.

“The Task Force strongly believes that treatment of geologically stored CO₂ as waste using waste disposal frameworks rather than resource management frameworks will diminish significantly the potential to meaningfully mitigate the impact of CO₂ emissions on the global climate through geologic storage (Interstate Oil & Gas Compact Commission, 2007).”

As technology continues to advance and the nation becomes more conscious of potential environmental impacts, opportunities will continue to arise for resource management as opposed to waste management.

New Production Frontiers and Increased Production

Oil and gas production has a profound impact on the economic health of communities at the local, state, and federal levels. Increased production means increases in tax revenues, more jobs, higher salaries, and economic opportunity for surrounding communities. Legislators and regulators encourage the responsible, safe development of new production frontiers and increased production through incentives and laws that encourage discovery wells, deep wells, increasing and improving production, and other production frontiers.

Increased Production

States commonly formulate incentives for techniques, technologies and methodologies that increase oil and gas production, often for the purposes of mitigating the effects of fluctuating market prices. This helps to prevent unemployment and loss of tax revenue as a result of business stoppages during economic fluctuations.

Table 5. Rules and Regulations to Increase Production

State	Alaska

Category	Tax incentive
Citation	Alaska Stat. § 43.55.023
Title	<i>Tax Credits for Certain Losses and Expenditures; Tax Credits for Qualified Capital Expenditures</i>
Discussion	
URL	http://www.touchngo.com/lglcntr/akstats/Statutes/Title43/Chapter55/Section025.htm
State	Alaska
Category	Tax incentive
Citation	Alaska Stat. § 43.55.165
Title	<i>Lease Expenditures</i>
Discussion	Qualified lease expenditures are deductible
URL	http://www.touchngo.com/lglcntr/akstats/Statutes/Title43/Chapter55/Section165.htm
State	Alaska
Category	Tax incentive
Citation	Alaska Stat. § 44.55.024
Title	<i>Additional Nontransferable Credits</i>
Discussion	For a calendar year for which a producer's tax liability under AS 43.55.011 (e) on oil and gas produced from leases or properties outside the Cook Inlet sedimentary basin, no part of which is north of 68 degrees North latitude, exceeds zero before application of any credits under this chapter, a producer that is qualified under (e) of this section may apply a tax credit against that liability of not more than \$6 million.
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-331
Title	<i>Listing Property for Taxation</i>

Discussion	Property Taxation. This act relates to the property tax valuation of oil and gas properties. Factors to be considered when assessing property taxes include the age of the well, quality of product produced, nearness to market, the cost of operation, the probable life of the well, character, extent and permanency of market, the quantity of product produced, the number of wells being operated and other factors affecting the value of the lease. The act also establishes the method for calculating the property taxes.
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	Natural Gas Severance Tax Reduction. Legislators enacted an annual stepped reduction in severance tax on natural gas from 7% to 4.33% over a three-year period. The final reduction took place in July of 1996.
URL	
State	Oklahoma
Category	
Citation	Okla. Stat. Ann. tit. 68, § 1001(B)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Reduction in the State's Gross Production Tax on Oil. The gross production tax rate levied on oil was changed from a rate of 7% to a variable rate of either 7%, 4% or 1%. Effective with the January 1999 production month, the gross production tax rate on oil is as follows: If the average price of Oklahoma oil as determined by the Tax Commission equals or exceeds seventeen dollars (\$17.00) per barrel, the tax shall be levied at seven percent (7%). If the average price of Oklahoma oil as determined by the Tax Commission is less than seventeen dollars (\$17.00) but equal to or exceeds fourteen dollars (\$14.00) per barrel, the tax shall be levied at four percent (4%). If the average price of Oklahoma oil as determined by the Tax Commission is less than fourteen dollars (\$14.00) per barrel, the tax shall be levied at one percent (1%). The average price as computed by the Oklahoma Tax Commission for both oil and natural gas shall be used to determine the applicable tax rate for the third month following production. The new version of this law extends the sunset from July 1, 2009 to July 1, 2012
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf

State	Oregon
Category	Tax Incentive
Citation	Or. Rev. Stat. § 324.080
Title	<i>14.001 First \$3,000 in Gross Sales Value</i>
Discussion	An exemption from the tax levied on oil or gas severance is granted for the first \$3,000 in gross sales value of the gross production each calendar quarter from each well.
URL	
State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 10-39A-3.1
Title	<i>Point of imposition of severance tax</i>
Discussion	Natural Gas Sold Out of State. The mineral severance tax is imposed at the time natural gas is sold or consumed, whichever occurs first. This effectively eliminates severance tax on natural gas sold out of state.
URL	S.D. Codified Laws Ann. § 10-39A-3.1#http://S.D. Codified Laws Ann. § 10-39A-3.1#
State	Utah
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(2)
Title	<i>Variable Severance Tax Rate</i>
Discussion	For oil, the severance tax rate is 3% up to and including the first \$13 per barrel, and 5% of the value exceeding \$13 per barrel. The severance tax rate natural gas is 3% for the first \$1.50 per Mcf, and 5% of value above \$1.50.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102
State	West Virginia
Category	Legislation
Citation	SB 328

Title	<i>Direct Use Sales Tax Exemption</i>
Discussion	When the exemption from sales tax for contractors was removed in 1989, subcontractors were included for the oil and gas industry, even though contract drillers were still exempt from sales tax on purchases used directly in the production of oil and gas. The 1994 Legislature clarified in Senate Bill 328 that this “direct use” exemption was available also to oil and gas subcontractors.
URL	

New Production Frontiers

States encourage the responsible development of new plays and fields to stimulate local economies.

Table 6. Incentives for New Production Frontiers

State	Alabama
Category	Tax incentive
Citation	Ala. Code § 40-20-2(a)(8) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Reduces production and privilege taxes for oil and gas wells permitted on or after July 1, 1996, and before July 1, 2002, except a replacement well for which the initial permit was issued before July 1, 1996. Applicable rate is reduced 50% for five years.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
State	Montana
Category	Tax incentive
Citation	Mont. Code Ann. § 15-36-304 (1995)
Title	<i>Production Rates Imposed on Oil and Natural Gas - Exemption</i>
Discussion	New Wells. Oil or gas production from new wells, or wells that have not produced for five years, are exempt from production taxes, except for the 5% resource indemnity tax, for the first 12 months of production.
URL	http://data.opi.mt.gov/bills/mca/15/36/15-36-304.htm

State	Nevada
Category	Tax incentive
Citation	Nev. Admin.Code § 522.150
Title	<i>Powers and Duties of Division</i>
Discussion	Reduced Administrative Fee for New Production. The amount of the administrative fee that a producer or purchaser of oil or natural gas must pay on new production pursuant to subsection 2 of Nevada Revised Statute 522.150 is one-half cent (five mills) per barrel of oil or per 50,000 cubic feet of natural gas, as appropriate. New production is defined as production from new wells or existing wells completed in new intervals as determined by the Commission on Mineral Resources. Any qualifying well will receive a reduced administrative fee for one full year. Upon completion of a qualifying well, the producer will submit a Form 5, "Well Completion Report." The production date as reported on the Form 5 will be the effective date for the reduced fee.
URL	http://search.leg.state.nv.us/isysquery/irl5136/1/doc
State	North Dakota
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-06
Title	<i>New Wells</i>
Discussion	New Wells. Production from new wells drilled and completed after April 27, 1987, is exempt from extraction taxes for the first 15 months of production and taxed at a rate of 4% thereafter (reduced from 6.5%). Affected by price trigger.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
State	North Dakota
Category	Tax incentive
Citation	N.D. Cent. Code § 57-51.1-03
Title	<i>Exemptions from Oil Extraction Tax</i>
Discussion	Tribal Lands Oil Tax Exemption (No Trigger). Initial production of oil from a well is exempt from extraction tax (6.5%) for 60 months if: the well is located on a reservation; or the well is located on trust land held for a tribe; or the land is held by a tribe at the time this Act was passed.

URL	http://www.legis.nd.gov/cencode/t57c511.pdf
State	North Dakota
Category	Tax incentive
Citation	N.D. Cent. Code § 57-51-02.4
Title	<i>Shallow Gas - Gross Production Tax Exemption</i>
Discussion	Shallow Gas Wells (No Trigger). Shallow gas from new or re-completed wells drilled and completed after June 30, 2003, is exempt from gross production taxes for the first 24 months of gas sales.
URL	http://www.legis.nd.gov/cencode/t57c51.pdf
State	Pennsylvania
Category	Laws and Regulation
Citation	PA Act 115
Title	<i>Dormant Oil and Gas Act</i>
Discussion	The purpose of this act is to facilitate the development of subsurface properties by reducing the problems caused by fragmented and unknown or unlocatable ownership of oil and gas interests and to protect the interests of unknown or unlocatable owners of oil and gas. It allows the know owner to proceed with development by establishing a trust for the proceeds due the unknown owner.
URL	http://www.legis.state.pa.us/cfdocs/billinfo/billinfo.cfm?year=2005&sind=0&body=S&type=B&BN=0594

Deep Wells

Deeper wells are often more cost-prohibitive to operators. By issuing incentives for deep wells, regulatory authorities encourage higher production levels and the development of new and innovative technologies.

Table 7. State Tax Incentives for Deep Wells

State	Alabama
Category	Tax incentive

Citation	Ala. Code § 40-20-2(a)(7) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	The code applies to offshore wells permitted after July 1, 1998, with a borehole depth greater than 18,000 feet. A privilege tax reduction from 6% (see Ala. Code 40-2-2(a)(5) (1975)) to 4% is available.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
State	Arkansas
Category	Tax incentive
Citation	Ark. Stat. 26-58-101
Title	
Discussion	Wells greater than 12,500 feet measured depth receive a reduction in severance tax from 5% to 1.5% for 24 months.
URL	
State	Louisiana
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633
Title	<i>Rates of Tax</i>
Discussion	This statute reduces severance taxes on the following categories of wells to stimulate exploration and development of horizontal, new discovery, deep gas, or condensate wells. Severance taxes from gas or condensate produced from wells drilled to at least 15,000 feet are suspended from the date of first production for a period of 24 months, or until payout of well cost, whichever comes first. Payout of the well cost shall be determined by the DNR.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. tit. 68, § 1001(I)

Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Deep Wells. For purposes of qualifying for the exemption, “depth” means the length of a maximum continuous string of drill pipe utilized between the drill bit face and the drilling rig’s kelly bushing. Deep wells spudded between July 1, 1994, and June 30, 1997, and drilled to a depth of 15,000 feet or greater shall be exempt from the gross production tax beginning with the date of first sale for a period of 28 months. Deep wells spudded between July 1, 1997, and June 30, 2002, and drilled to a total depth of 12,500 feet or greater shall be exempt from the gross production tax for a period of twenty-eight (28) months beginning with the date of first sale. Deep wells spudded between July 1, 2002, and June 30, 2009, and drilled between a depth of 12,500 feet and 14,999 feet shall be exempt from the gross production tax for a period of 28 months beginning with the date of first sale. Deep wells spudded between July 1, 2002, and June 30, 2011, and drilled between a depth of 15,000 feet and 17,499 feet shall be exempt from the gross production tax for a period of 48 months beginning with the date of first sale. Deep wells spudded between July 1, 2002, and June 30, 2011, and drilled to a total depth of 17,500 feet or greater shall be exempt from the gross production tax for a period of 60 months beginning with the date of first sale. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 201.057(c)
Title	<i>Temporary Exemption or Tax Reduction for Certain High-Cost Gas</i>
Discussion	Extension on the tax rate reduction for high-cost natural gas wells. There is a 100% reduction for up to 120 months or until cumulative value of exemption equals 50% of drilling and completion cost. The total allowable credit for taxes paid for reporting periods before the date the application is filed may not exceed the total tax paid on the natural gas that otherwise qualified for the exemption or tax reduction and that was produced during the 24 months immediately preceding the month in which the application for certification under this section was filed with the commission. The 78th Texas Legislature removed the filing deadline and made the severance tax exemption permanent. This corresponds to HB 2424.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.201.htm

Discovery Wells

Discovery Well

"An exploratory well that encounters a new and previously untapped mineral deposit. A discovery well may open up a new field, or it may locate a new and previously unknown producing horizon in an old field." (Williams, Meyers, Martin, & Kramer, 2006)

States foster discovery wells through incentives such as severance tax reductions and allowances.

Table 8. State Incentives for Discovery Wells

State	Alaska
Category	Tax incentive
Citation	Alaska Stat. § 43.55.025
Title	<i>Alternative Tax Credit for Oil and Gas Exploration</i>
Discussion	Tax credits for discovery wells
URL	http://www.touchngo.com/lglcntr/akstats/Statutes/Title43/Chapter55/Section025.htm
State	Arizona
Category	Tax incentive
Citation	Ariz. Rev. Stat 42-15001
Title	<i>Assessed Value of Class I Property</i>
Discussion	The Property Tax Reform and Reduction Act, passed by the 42nd Legislature in July 1996, reduced the property tax assessment ratio for all real and personal property used by producing oil, gas, and geothermal interests to 28% of full cash value from 100%. The tax rate will decrease an additional 1% per year until holding at 25% in 1999 through December 2005, 24.5% through December 2006, 24% through December 2007, 23% through December 2008, 22% through December 2009, 21% through December 2010, and 20% beginning from and after December 31, 2010.
URL	http://www.azleg.state.az.us/FormatDocument.asp?inDoc=/ars/42/15001.htm&Title=42&DocType=ARS

State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1001
Title	<i>Tax Incentives — Increased Volume by Enhanced Recovery</i>
Discussion	New discovery oil wells receive a 75% severance tax credit for taxes otherwise due for 5 to 10 years, depending on depth of well.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1001.htm
State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §26-58-111
Title	<i>Rates of Tax</i>
Discussion	New discovery gas wells in conventional source of supply receive reduction in severance tax from 5% to 1.5% for 24 months.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm#http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm
State	Kansas
Category	Tax incentive
Citation	Kan. Admin. Regs. §82-3-312
Title	<i>Gas Allowables and Drilling Unit</i>
Discussion	This regulation increased the daily allowable from 25% of the well's calculated absolute open-flow (AOF) to 50% of AOF. This amended rule also raises the minimum gas allowable from 150 Mcfpd to 250 Mcfpd.
URL	http://www.kcc.state.ks.us/conservation/cons_rr_110308.pdf
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 76-323

Title	<i>State Geological Survey; Chancellor Ex Officio Director; State Geologist, Appointment, Unclassified</i>
Discussion	See Kan. Stat. Ann. § 76-322
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 76-326
Title	<i>Geological Survey with Reference to Natural Products of Economic Importance</i>
Discussion	See Kan. Stat. Ann. § 76-322
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217(b)(1)
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	Natural gas used in injection projects, for fuel in recovery operations, or from a well having an average daily production with a value not more than \$87, is exempt from severance and production taxes.
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217(b)(4)
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	New Wells/New Pools. Production from new pools is exempt from severance tax for 24 months from commencement of production.

URL	
State	Louisiana
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633
Title	<i>Rates of Tax</i>
Discussion	This statute reduces severance taxes on the following categories of wells to stimulate exploration and development: horizontal, new discovery, deep gas, or condensate wells. Severance taxes from certified new or discovery oil and natural gas wells are suspended from the date of first production for a period of 24 months, or until payout of well cost, whichever comes first. Payout of the well cost shall be determined by the DNR.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. tit. 68, § 1001(l)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	New Discovery Wells. New Discovery is defined as production of oil, natural gas, or oil and natural gas from: (a) A well, spudded or re-entered prior to July 1, 1997, which discovers crude oil in paying quantities, and is located more than one mile from the nearest oil well producing from the same interval. (b) A well, spudded or re-entered on or after July 1, 1997, and prior to July 1, 2009, which discovers crude oil in paying quantities, and is located more than one mile from the nearest oil well producing from the same interval of the same formation. (c) A well, spudded or re-entered prior to July 1, 1997, which discovers crude oil in paying quantities beneath current production in a deeper producing formation, located more than one mile from the nearest oil well producing from the same deeper interval. (d) A well, spudded or re-entered on or after July 1, 1997, and prior to July 1, 2009, which discovers crude oil in paying quantities beneath current production in a deeper producing interval, located more than one mile from the nearest oil well producing from the same interval of the same formation. (e) A well, spudded or re-entered prior to July 1, 1997, which discovers natural gas in paying quantities, and is located more than two miles from the nearest natural gas well producing from the same interval. (f) A well, spudded or re-entered on or after July 1, 1997, and prior to July 1, 2009, which discovers natural gas in paying quantities, and is located more than two miles from the nearest natural gas well producing from the same interval. (g) A well, spudded or re-entered prior to July 1, 1997, which discovers natural gas in paying quantities beneath current production in a deeper producing

	interval, that is located more than two miles from the nearest natural gas well producing from the same deeper interval. (h) A well, spudded or re-entered on or after July 1, 1997, and prior to July 1, 2009, which discovers natural gas in paying quantities beneath current production in a deeper producing interval, that is located more than two miles from the nearest natural gas well producing from the same deeper interval. Qualified new discovery wells shall be exempt for a period of 28 months from the date of first sales. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Utah
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(5)(b)
Title	<i>Wildcat Wells</i>
Discussion	No severance tax is imposed on the first 12 months of production from wildcat wells started after Jan. 1, 1990.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102
State	Utah
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(5)(c)
Title	<i>New Development Wells</i>
Discussion	The first six months of production for development wells started after Jan. 1, 1990, is exempt from severance taxes.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102
State	Wyoming
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	Discovery Wells. Wildcat wells are exempt from severance taxes for a period of four

	years commencing from the date of first production.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2

Services

Some states offer a sales and use tax exemption for “services” –generally electricity other utilities used directly in the oil and gas exploration process.

Table 9. Incentives for Services

State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-3606 (kk)(1)(c)
Title	<i>Kansas Retailers' Sales Tax</i>
Discussion	Electricity and other utilities used in the severance of oil and gas are exempt from the state sales tax.
URL	
State	Montana
Category	Tax incentive
Citation	Mont. Code Ann. § 15-36-305 (1995
Title	<i>Determination of Gross Value of Product</i>
Discussion	Crude oil or gas used by operators in connection with operations is tax exempt.
URL	http://data.opi.mt.gov/bills/mca/15/36/15-36-305.htm
State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 10-45-5.3
Title	<i>Tax on Oil and Gas Field Services</i>

Discussion	Oilfield Services. An oilfield services sales tax provision provides a 1% tax exemption on oilfield services. The effective tax rate is 3%.
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=10-45-5.3
State	Virginia
Category	Tax incentive
Citation	Va. Code Ann. § 58.1-609.3 (12)
Title	<i>Commercial and Industrial Use Exemptions</i>
Discussion	Raw materials, fuel, power, energy, supplies, machinery, tools and repair/replacement parts used directly in the drilling, extraction, refining, or processing of natural gas or oil and reclamation of the well area are exempt from the 4% state sales and use tax, and the 1% local sales and use tax. Exemption includes all phases of production and processing, including gathering, until gas is pipeline quality.
URL	http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+58.1-609.3

Other Incentives

Some states offer tax incentives for unique programs, economic stimulation and production on public lands.

Table 10. Other Regulatory Streamlining Incentives

State	Alabama
Category	Laws and Regulation
Citation	Ala. Code § 9-17-33
Title	<i>Disposition of proceeds derived from sale of oil or gas producti</i>
Discussion	Increases the minimum royalty payment threshold to \$100
URL	
State	Arkansas

Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § A-8
Title	<i>Reporting Requirements for Mineral Proceeds Escrow Accounts</i>
Discussion	The new rule establishes specific requirements for reporting of funds held for the benefit of unknown or unlocatable mineral owners. The requirements: *Must hold funds in an account with a bank licensed to do business in Arkansas. *Must file an annual report detailing the following: name and address of owner; legal description of property interest; location of number of account; persons authorized to withdraw from account; and whatever information the AOGC may require. The report is to be filed by February 1 every year, and there will be a civil penalty of up to \$1,000 for each violation.
URL	
State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § B-11
Title	<i>Natural Gas or Fresh Water Supply Wells for Domestic Use</i>
Discussion	This new rule provides methodology for the transfer of natural gas production wells to landowners for domestic use purposes. Production may be used only on property where the well is located. Written agreement from all owners must be filed. the rule provides methodology for the transfer of natural gas or oil production wells to landowners for use as domestic water supply wells.
URL	
State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § B-40
Title	<i>Administrative Approval of Exceptional Locations</i>
Discussion	The amendment allows administrative approval for wells that have been drilled, but prior to commencement of production. If administrative application is denied, the applicant may request a hearing in accordance with A-2 and A-3, except that no additional fee is required. It authorizes administrative approval for sharing an exceptionally located well between two or

	more integrated drilling units, which are held by production, based upon any “calculated area” (shape) that all working interest owners in all units agree upon. The director has discretion to refer the application to the Commission for a hearing.
URL	
State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § D-17
Title	<i>Regulation of Natural Gas Pipelines</i>
Discussion	This amendment clarifies that Arkansas Oil and Gas Commission (AOGC) jurisdiction includes all types of pipelines upstream of custody transfer, not just type gathering lines. It exempts pipeline systems less than 1 mile in length, and which do not cross public roads, railroads, or perennial streams from paying the permit fee. It also establishes requirements for lines not subject to federal regulation; clarifies incorporation of federal construction, operation, and maintenance requirements into state regulation; And specifies additional requirements for pipelines containing Hydrogen Sulfide.
URL	
State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § E-3
Title	<i>Exploration and Production Fluid Handling and Transportation</i>
Discussion	The new rule requires each “transporter” using motor vehicles to transport exploration and production fluid (excludes fresh water) to be permitted. Each transporter is required to submit a Form 1 Organization Report, and a Form 32, along with applicable application fee (\$100 per tank). A permit sticker is to be placed at the rear of each transportation tank. Each transporter shall be in compliance with this rule by March 30, 2009. Manifests must be maintained to show produced fluids received, transporter, delivery, and disposal.
URL	
State	California
Category	Laws and Regulation
Citation	AB 1234

Title	<i>Transfer of Pipeline Right of Way</i>
Discussion	This law allows a utility to transfer easements and right of ways associated with a section of gathering pipeline to an individual producer or a cooperative of producers.
URL	
State	California
Category	Laws and Regulation
Citation	AB 1960
Title	<i>Article 4.4 Regulation of Production Facilities</i>
Discussion	New legislation was passed giving the California Division of Oil, Gas, and Geothermal Resources (DOGGR) specific authority to regulate oilfield production facilities. DOGGR did not have this specific authority until now.
URL	
State	Colorado
Category	Laws and Regulation
Citation	
Title	<i>New Rule Development</i>
Discussion	Colorado promulgated new rules and procedures effective May 1, 2009, to address increases in oil and gas activity in the state. In 2007, upon the urging and initiative of the Colorado Department of Natural Resources, the General Assembly passed legislation to increase the Commission's regulatory authority and oversight obligations to better address the potential adverse impacts that can accompany oil and gas development. The General Assembly declared that it is in the public's interest to foster the responsible, balanced development of Colorado's oil and gas resources consistent with the protection of public health, safety, and welfare, including protection of the environment and wildlife resources. C.R.S. § 34-60-102(1). (cogcc.state.co.us). Read the IOGCC case study later in this chapter
URL	
State	Kansas
Category	Laws and Regulation

Citation	Kan. Stat. Ann. § 55-1624
Title	<i>FERC-Ordered Refunds of Tax Reimbursements; Recovery</i>
Discussion	Royalty Interests, Statute of Limitations on FERC-Ordered Refunds. The period of time during which first sellers of natural gas could commence a civil action against royalty interest owners to obtain refunds of reimbursements for ad valorem taxes on royalty interests during the years 1983 through 1988 was declared expired and the refund claims were deemed to be uncollectible. The legislature reaffirmed that the Kansas five-year statute of limitations found in K.S.A. 60-511 applied to these claims created when the Federal Energy Regulatory Commission (FERC), more than 15 years after its initial determination, reversed its long-standing policy that the Kansas ad valorem tax, which was based on production, was a severance tax and could be added to the maximum lawful price set by the NGPA at that time. FERC ordered first sellers to refund the amount of the ad valorem tax. This statute and that part of the FERC order relating to penalty and interest is under court challenge in both state and federal courts.
URL	
State	Louisiana
Category	Laws and Regulation
Citation	
Title	<i>New Safety Rules Issued</i>
Discussion	In a January 12, 2009, press release, Louisiana Commissioner of Conservation James H. Welsh issued two new permanent rules and a new policy that combine to give Louisiana some of the most stringent oil and gas drilling safety rules in the country. The new permanent rules, which were effective as of Dec. 20, 2008, track the federal government's requirements on the drilling it regulates, and, as of January 12, a new office policy bans wells within 1,000 feet of the crossing of Interstate highways over major waterways. The 1,000-foot ban includes such areas as the I-10 crossing of the Sabine River, Calcasieu River, Atchafalaya Basin, Mississippi River, Lake Pontchartrain and Pearl River; the I-12 crossing of the Amite River; and the I-20 crossing of the Red, Ouachita, Tensas and Mississippi rivers, among others. Most oil and gas producing states have no rules addressing distance between oil and gas drilling operations and roadways, and the few that do require no more than a 100-foot distance. One of the rules places many new requirements on well operators to ensure the proper design, testing, and use of blowout preventers and diverters, as well as new requirements for the quick operation of valves controlling in-pipe gas and fluid flow. The rule also requires operators to ensure that employees of contracted drilling companies receive recurring training on well control practices and establish procedures to ensure employees retain the knowledge,

	skill, and competency to perform their well control duties. These safety rules were developed after extensive study by the Louisiana Department of Natural Resources' Office of Conservation and the Commissioner's Ad Hoc Committee on Drilling Safety. The committee included representatives from the state, the oil and gas industry, and landowner interests. http://dnr.louisiana.gov/cons/memos/memo20090112-well-location-policy-interstates.pdf
URL	http://dnr.louisiana.gov/cons/rules200812.pdf
State	Louisiana
Category	Laws and Regulation
Citation	Louisiana HB 159 - 2009 Regular Session (Act 126)
Title	<i>An act to amend and reenact R.S. 30:28(B), relative to drilling permits; to provide for the validity of drilling permits; and to provide for related matters.</i>
Discussion	Effective August 15, 2009, under Act 126 of the 2009 Regular Session, an operator can acquire a permit to drill with a one-year term (period of validity) as opposed to the traditional 180-day term. Both terms, the traditional 180-day permit and the one-year permit will be valid options. The associated fees for each category of the traditional 180-day permit will double for the one-year permit option.
URL	
State	Nevada
Category	Laws and Regulation
Citation	Nev. Admin.Code § 522.040
Title	<i>Permits to Drill Wells Required; Fees</i>
Discussion	See Nev. Admin.Code § 522.150
URL	http://www.leg.state.nv.us/NRS/NRS-522.html#http://www.leg.state.nv.us/NRS/NRS-522.html#NRS522Sec040
State	Nevada
Category	Laws and Regulation
Citation	Nev. Admin.Code § 522.050
Title	<i>Payment of Expenses for IOGCC; Administrative Fee</i>

Discussion	See Nev. Admin.Code § 522.150
URL	http://www.leg.state.nv.us/NRS/NRS-522.html#NRS522Sec050
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann § 1509.03
Title	<i>Administrative Rules</i>
Discussion	See Ohio Rev. Code Ann. §1509.02
URL	http://codes.ohio.gov/orc/1509.02#http://codes.ohio.gov/orc/1509.03
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann § 1509.06
Title	<i>Application for Permit to Drill, Reopen, Convert, or Plug Back a Well</i>
Discussion	See Ohio Rev. Code Ann. §1509.02
URL	http://codes.ohio.gov/orc/1509.03
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann § 1509.23
Title	<i>Health and Safety Rules for Drilling of Wells and Production of Oil and Gas</i>
Discussion	See Ohio Rev. Code Ann. §1509.02
URL	http://codes.ohio.gov/orc/1509.23
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann § 1509.31
Title	<i>Notice to Holder of Royalty Interest of Assignment or Transfer of Entire Interest in Lease</i>

Discussion	See Ohio Rev. Code Ann. §1509.02
URL	http://codes.ohio.gov/orc/1509.31
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann. § 1509.02
Title	<i>Division of mineral resources management</i>
Discussion	Division of Mineral Resources Management. Under House bills 278 and 279, Ohio Revised Code Sections 1509.02, 1509.03, 1509.06, 1509.23 and 1509.31 were amended and 1509.39 was repealed. The amendments and repeal provided for the Division of Mineral Resources Management to be the sole and exclusive authority to regulate the permitting, location, and spacing of oil and gas wells in Ohio. The House bills created the Oil and Gas Advisory Council, which advised the chief on rules drafted pursuant to the enactment of the bills. Public hearings were held on the draft rules in June and July of 2005 with the effective date of the rules in August 2005. The rules provide more authority for the chief in the areas of safety during the drilling and production of oil and gas wells, protection of groundwater resources and environmental protection for wells drilled in “urbanized areas” (all municipal corporations and any township with an unincorporated population exceeding 5,000).
URL	http://codes.ohio.gov/orc/1509.02
State	Oregon
Category	Tax Incentive
Citation	Or. Rev. Stat. § 324.090(1)
Title	<i>14.002 State and Local Interests</i>
Discussion	Any royalty or other interest in oil or gas owned by the state or local government is exempt from the oil and gas severance tax.
URL	
State	Oregon
Category	Tax Incentive
Citation	Or. Rev. Stat. § 324.090(2)
Title	<i>14.003 Credit for Property Taxes Paid</i>

Discussion	A credit is allowed against the oil and gas severance tax for all property taxes imposed. This includes taxes on any property rights attached to the right to produce oil and gas, producing oil and gas leases, and machinery and equipment used in the operation of the well.
URL	
State	Pennsylvania
Category	Tax incentive
Citation	73 P.S. § 2260.101 et. Seq.
Title	<i>Regulatory Electronic Transactions</i>
Discussion	Electronic Transactions Act. In December of 1999 the Pennsylvania Legislature passed this version of the Uniform Electronic Transactions Act. This legislation can be considered an incentive in that it allows for the electronic submission of permit applications and required reports.
URL	
State	South Dakota
Category	Laws and Regulation
Citation	S.D. Codified Laws § 45-9-40
Title	<i>Order of board for unit operation of a pool the percentage of owners required to ratify an oil and gas unit</i>
Discussion	To encourage more exploration and increase production of oil and gas resources in South Dakota while protecting all owners' rights and preventing the drilling of unnecessary wells, the South Dakota Legislature approved, and Governor Rounds signed HB1014. The statute, 45-9-40, took effect July 1, 2004.
URL	http://legis.state.sd.us/sessions/2004/bills/HB1014enr.pdf
State	Texas
Category	Laws and Regulation
Citation	
Title	<i>Severance Tax Administration</i>
Discussion	Removal of accelerated biennial due date ("speed up") for natural gas severance taxes and penalties for speeding up late payments. Eliminates early payment of natural gas tax in odd-

	numbered years. Agency: Comptroller of Public Accounts.
URL	
State	Texas
Category	Tax incentive
Citation	Tex. Nat. Res. Code Ann. § 91.402(d)
Title	<i>Time for Payment of Proceeds</i>
Discussion	Producers may delay payment of royalties until they reach a total of \$100 or 12 months proceeds have accumulated, whichever comes first. Annual reporting for the lease may not exceed \$3,000. This corresponds to HB 1593.
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.91.htm#91.402

Production Enhancements, Efficiency Improvements, and New Technology Usage

Mitigating potential environmental risks is intrinsically tied to safe, efficient operations and equipment. Newer technologies and methodologies, production enhancements, and efficiency improvements mean less waste and less long- and short-term environmental impacts.

Environmental Audits

State regulatory agencies encourage the performance of environmental audits by operators and producers. Environmental audits evaluate the environmental impact of operations. By working cooperatively with operators and producers to find solutions to potential environmental problems, rather than adopting a strictly punitive approach, regulators develop relationships that foster “above and beyond” behavior by the community they regulate.

Table 11. State Environmental Audit Rules and Regulations

State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 1-40-3

Title	<i>Qualifications of secretary.</i>
Discussion	See S.D. Codified Laws Ann. § 1-40-33
URL	# http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=1-40-3#
State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 1-40-33
Title	<i>Voluntary Environmental Audits</i>
Discussion	Voluntary environmental audit privilege provides limited immunity for violations of environmental law, rule, regulation, or permit enforced by the Department of Environment and Natural Resources that are discovered and reported to the department within 30 days. The department is prohibited from prosecuting those violations if they are corrected within 60 days. If the violations are not corrected within 30 days, a written compliance schedule may be negotiated between the department and the operator. The department is prohibited from requesting the results of an environmental audit. The environmental audit may not be used as a civil or criminal defense if the producer: (a) willfully and knowingly committed the violation; (b) has a pattern of repeated violations; (c) has not corrected the violation within 60 days of discovery; and (d) has been penalized for a violation within two years of disclosure of the present violation.
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=1-40-33
State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 1-40-34
Title	<i>Application of environmental audit provisions--Discovery of violations.</i>
Discussion	See S.D. Codified Laws Ann. § 1-40-33
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=1-40-34
State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 1-40-35

Title	<i>Environmental audit subject to discovery--Summary of disclosed violation.</i>
Discussion	See S.D. Codified Laws Ann. § 1-40-33
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=1-40-35
State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 1-40-36
Title	<i>Use of environmental audit as defense.</i>
Discussion	See S.D. Codified Laws Ann. § 1-40-33
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=1-40-36
State	Texas
Category	Tax incentive
Citation	HB 2473
Title	<i>Texas Environmental, Health, and Safety Audit and Compliance Management System Privilege Act.</i>
Discussion	The act encourages businesses to voluntarily comply with environmental and occupational health and safety laws by performing audits and implementing compliance management systems. (1995)
URL	http://www.capitol.state.tx.us/tlodocs/74R/billtext/doc/HB02473F.doc
State	Wyoming
Category	Tax incentive
Citation	Wyo. Stat. § 35-11-1105
Title	<i>Environmental Audit Privilege; Exceptions; Burden of Proof; Waiver; Disclosure After in Camera Review; Application</i>
Discussion	This privilege gives oil and gas companies complete immunity from fines and penalties of the Department of Environmental Quality for violations that are reported to the department along with remediation plans.

URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/18fd2/1a278/1a626/1a64b
State	Wyoming
Category	Tax incentive
Citation	Wyo. Stat. § 35-11-1106
Title	<i>Limitation on Civil Penalties; Voluntary Reports of Violations</i>
Discussion	See Wyo. Stat. § 35-11-1105
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=mainh.htm&cp=wycode/18fd2/1a278/1a626/1a652

Production Enhancements / Workovers

Workovers

"Operations on a producing well to restore or increase production." (Williams & Meyers)

Reworking and modifying equipment and applying improved processes and methodologies provide an opportunity for increased production, increased efficiencies, and reductions in environmental impact.

Table 12. Incentives for Workovers

State	New Mexico
Category	Tax incentive
Citation	7-29B-1 NMSA 1978
Title	<i>Well Workover Project Tax Incentive</i>
Discussion	Well Workover Project. The incentive reduces severance taxes from 3.75% to 2.45% for oil and gas produced from wells having qualified workover operations performed. It does not apply when the price of oil is \$24 or more per barrel.

URL	
State	North Dakota
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-08
Title	<i>Workover Exemption</i>
Discussion	Workover Project Determination. Applicants have the burden of establishing entitlement to the exemption provided in NDCC § 57-51.1-03 and upon completion of the workover project shall submit all information necessary for a determination by the director. Production resulting from qualifying workover projects is exempt from extraction taxes for 12 months, beginning the third month after completion of the workover project, and is taxed at 4% thereafter. Wells that have produced less than 50 BOPD during the last six months of continuous production before workover qualify for this exemption. The operator must notify the NDIC before beginning the project. The project must cost at least \$65,000, or production must increase 50% or more in the first two months after project completion. Affected by price trigger.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001(G)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Production Enhancements – Recompletions. A rebate of the gross production tax may apply to the following: (A) For production enhancement projects having a project beginning date prior to July 1, 1997, any downhole operation in an existing oil well or natural gas well that is conducted to establish production of oil or natural gas from any geological interval not currently completed or producing in such existing oil or natural gas well. (B) For production enhancement projects having a project beginning date on or after July 1, 1997, and prior to July 1, 2009, any downhole operation in an existing oil well or natural gas well that is conducted to establish production of oil or natural gas from any geologic interval not currently completed or producing in such existing oil or natural gas well within the same or a different geologic formation. Production Enhancements – Workovers. A rebate of gross production tax may apply to the following: (A) Any downhole operation in an existing oil or natural gas well that is designed to sustain, restore or increase the production rate or ultimate recovery in a geologic interval currently completed or producing in said existing oil or natural gas well. (B) For production enhancement projects having a project beginning date prior to July 1, 1997, “workover”

	includes, but is not limited to, acidizing, reperforating, fracture treating, sand/paraffin removal, casing repair, squeeze cementing, setting bridge plugs to isolate water productive zones from oil or natural gas productive zones, or any combination thereof. (C) For production enhancement projects having a project beginning date on or after July 1, 1997, and prior to July 1, 2009, "workover" includes, but is not limited to, acidizing; reperforating; fracture treating; sand, paraffin, or scale removal or other wellbore cleanouts; casing repair; squeeze cementing; installation of compression on a well or group of wells or artificial lifts on oil, natural gas, or oil and natural gas wells, including plunger lifts, rod pumps, submersible pumps and coiled tubing velocity strings; downsizing existing tubing to reduce well loading; downhole commingling; bacteria treatments; upgrading the size of pumping unit equipment; setting bridge plugs to isolate water production zones; or any combination thereof. "Workover" shall not mean the routine maintenance, routine repair, or like-for-like replacement of downhole equipment such as rods, pumps, tubing, packers, or other mechanical devices. Qualified production enhancements shall be exempt for a period of 28 months from the date of first sale after project completion. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 202.061
Title	<i>Tax Credit for Enhanced Efficiency Equipment</i>
Discussion	The code provides for a severance tax credit for enhanced efficiency equipment installed on marginal oil wells between September 1, 2005, and September 1, 2009. "Enhanced efficiency equipment" means equipment used in the production of oil that reduces the energy used to produce a barrel of fluid by 10 percent or more when compared to commonly available alternative equipment. The term does not include a motor or downhole pump. Equipment does not qualify as enhanced efficiency equipment unless an institution of higher education approved by the comptroller that is located in this state and that has an accredited petroleum engineering program evaluated the equipment and determined that the equipment does produce the required energy reduction.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.061
State	Utah
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(6)
Title	<i>Workovers/Recompletions</i>

Discussion	A working interest owner who pays for all or part of the expenses of a recompletion or workover is entitled to a nonrefundable tax credit equal to 20 percent of those expenses. The tax credit may not exceed \$30,000 per well during each calendar year.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102
State	Wyoming
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	Workover wells are exempt from severance taxes for a period of 24 months immediately following the workover or recompletion.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2

Primary, Secondary, and Tertiary Recovery Methods

Enhanced Oil Recovery (EOR)

"The increased recovery from a pool achieved by artificial means or by the application of energy extrinsic to the pool, which artificial means or application includes pressuring, cycling, pressure maintenance, or injection to the pool of a substance or form of energy but does not include the injection in a well of a substance or form of energy for the sole purpose of (i) aiding in the lifting of fluids in the well, or (ii) stimulation of the reservoir at or near the well by mechanical, chemical, thermal, or explosive means." The Alberta Oil and Gas Conservation Act, R.S.A. 1970, c.267, section 2(1)(15) (Williams, Meyers, Martin, & Kramer, 2006).

While the familiar depiction of oil spewing from the ground like a giant fountain makes it easy to imagine that oil accumulates in vast underground lakes, the reality is that hydrocarbons are stored in the tiny pores of permeable rock. Under great heat and pressure, oil and gas move underground, taking the path of least resistance until either migrating to the surface as a seep or stopped by an impermeable layer of rock such as basalt or shale, which causes it to pool.

Tapping directly into the pool and allowing oil and gas to flow under its own pressure is commonly the initial means of recovery. Often referred to as “easy oil” because it is relatively easy to recover and is pushed up by pressure, this type of resource is largely tapped out.

Pump jacks are used to withdraw oil when the pressure drops and is no longer sufficient to push the oil to the surface. Even then, unless further measures are taken to recover the oil and gas, as much as 90% of the oil in a reservoir remains unrecovered.

Secondary methods of oil and gas recovery, such as waterflooding, gas flooding, or CO₂ gas flooding, have been in use for more than half a century and are used to maintain reservoir pressure and sweep oil toward producing wells.

The petroleum industry has been experimenting with tertiary, or “third stage” hydrocarbon production that alters the original properties of the oil, and EOR technologies since at least the 1930s, but until the Arab oil embargo of 1973, there was limited incentive for producers to employ techniques beyond waterflooding to recover the huge volume of resources left in place. (Waste Management)

Rising demand for energy, depletion of “easy oil” reserves, and economic incentive have driven innovation aimed at improving EOR techniques that increase production from conventional oil and gas reserves and also have given rise to large-scale resource recovery of “unconventional” hydrocarbon reserves. Since the ‘90s, new Alaska fields have been instituting EOR almost from the start of production.

Improved EOR techniques are encouraging production in unconventional settings, such as tight sands, low-permeability shales, and coal seams.

Making optimal use of available domestic fossil fuel resources is key to ensuring adequate supplies of energy for American consumers. This imperative is driving the focus on the significant oil and natural gas resources remaining in America's oldest producing areas, the Appalachian and Illinois basins. Estimates of remaining technically recoverable resources in these basins, including proven reserves, are

4.8 billion barrels of oil and 79 trillion to 96 trillion cubic feet of natural gas. EOR techniques are essential for recovery of most of the remaining hydrocarbon reserves because they exist mainly in unconventional settings such as coal seams, Devonian-age shales, low-permeability (tight) gas sands, and previously untapped deep formations. (Interstate Oil and Gas Compact Commission, 2006)

South Dakota Has a Record Production Year in 2008

The state of South Dakota issued a press release in April 2009 recognizing the importance of EOR techniques in increasing production. The state experienced record-breaking oil production and the state's highest natural gas production in more than a quarter of a century, according to final oil and gas production figures for 2008 compiled by the South Dakota Department of Environment and Natural Resources.

The state produced a record 1,696,842 barrels of crude oil from 162 wells in 2008. The record amount surpassed the previous high of 1,668,197 barrels produced in 1988 from 207 wells. State oil production declined from the 1988 high to a low in 1999 of 1,100,249 barrels from 150 wells. Commercial oil production records have been kept since 1954 when oil was first discovered in Harding County. The number of producing oil wells has remained relatively consistent since the 1999 low, but production is on the rise. This can be attributed to the use of horizontal drilling and enhanced recovery techniques in the Red River formation in Harding County, which occurs at about 9,000 feet below the land surface.

"Re-entering older vertical wells for the purpose of drilling horizontal laterals is good conservation practice because it prevents physical waste by stalling plugging of a depleting well and it also prevents the drilling of unnecessary new wells. In addition, there can be a considerable financial saving, since the cost of drilling and equipping a new horizontal well is 5 or 6

times the cost of converting an existing vertical well.” – Fred Steece, Oil and Gas Supervisor, Oil and Gas Section, South Dakota Dept. of Environmental Resources

Table 13. Incentives for EOR

State	Alabama
Category	Tax incentive
Citation	Ala. Code § 40-20-2(a)(2) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Reduces the privilege tax to 4% for incremental production from qualified enhanced oil recovery projects and supplemental enhanced recovery projects. The State Oil and Gas Board of Alabama approves the project and calculates "incremental production" by determining a base production rate.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
State	Alabama
Category	Tax incentive
Citation	Ala. Code § 40-20-2(b) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Exempts natural gas lawfully injected for the purpose of lifting oil or gas from privilege taxes.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1001
Title	<i>Tax Incentives — Increased Volume by Enhanced Recovery</i>
Discussion	EOR projects approved by the Oil and Gas Commission are entitled to a 50% reduction in

	severance taxes for the incremental volume of oil attributable to the project.
URL	# http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1001.htm#
State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1003
Title	<i>Tax Incentives -- Increased Volume by New Research Technology</i>
Discussion	Incremental production oil due to application of new research technologies approved by the Oil and Gas Commission is exempt from severance tax.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1003.htm
State	Colorado
Category	Tax incentive
Citation	Colo. Rev. Stat. § 39-7-102(2)(a) and (b)
Title	<i>Valuation for Assessment</i>
Discussion	Oil and gas leasehold and lands employing secondary/tertiary recovery or recycling projects are assessed at 75% of the annual gross production value.
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	Secondary/Tertiary Recovery. Incremental production resulting from a tertiary recovery process is exempt from severance and production taxes. Incremental Production. A severance tax exemption for a period of seven years is given to the incremental production resulting from a production enhancement project begun on or after July 1, 1998. Incremental severance and production is defined as production in excess of base production. Base production is the average monthly amount of production for the 12-month period immediately prior to the project beginning date, minus the monthly rate of production decline. The monthly rate of production decline would be determined with reference to the same 12-month period used to determine the base production. The monthly rate of

	production decline is the decline that would have occurred except for the enhancement project. The credit does not apply in any fiscal year if in the preceding calendar year the price exceeded, in the case of oil, \$20 per barrel; or, in the case of natural gas, \$2.50 per Mcf. Language was added to clarify the existing law to include wells that have an established incline in production volumes and for wells that have had casing failures (or for other reasons lack production volumes) immediately prior to the enhancement project.
URL	
State	Louisiana
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633.4
Title	<i>Rates of Tax</i>
Discussion	Tertiary Recovery. No severance tax shall be due on production from a qualified tertiary recovery project approved by the Secretary of the Department of Natural Resources until the project has reached payout. Payout is calculated from the total of production from investment costs; expenses particular to the tertiary project, not to include charges attributable to primary and secondary operations on that reservoir; and interest at commercial rates.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399
State	Mississippi
Category	Tax incentive
Citation	Miss. Code Ann. § 27-25-503 (1)
Title	<i>Severance Taxes -- Privilege Tax Levied; Exemptions</i>
Discussion	The code reduces the assessed tax rate to 3% of the value of the oil produced by an enhanced oil recovery method in which carbon dioxide is used when transported by a pipeline to the oil well, has been expanded to include any other enhanced oil recovery method approved and permitted by the State Oil and Gas Board on or after April 1, 1994.
URL	http://michie.com/mississippi/lpext.dll?f=templates&fn=main-h.htm&cp=
State	Montana

Category	Tax incentive
Citation	Mont. Code Ann. § 15-36-304 (1995)
Title	<i>Production Rates Imposed on Oil and Natural Gas - Exemption</i>
Discussion	Secondary/Tertiary Recovery. Production taxes are reduced for incremental production from secondary and tertiary recovery projects. Incremental secondary production is taxed at 8.5%. Incremental tertiary production is taxed at 5.8%. This incentive is suspended when the price of West Texas Intermediate crude oil exceeds \$30 per barrel for a calendar quarter and reactivates when the price of oil drops below \$30 per barrel.
URL	http://data.opi.mt.gov/bills/mca/15/36/15-36-304.htm
State	New Mexico
Category	Tax incentive
Citation	7-29A-2 NMSA 1978
Title	<i>Enhanced Oil Recovery Tax Incentive</i>
Discussion	Enhanced Oil Recovery Projects. The severance tax is reduced from 3.75% to 1.875% for oil produced from the date of positive production response. OCD approval is required. The incentive does not apply when the oil price is \$28 or more per barrel.
URL	
State	North Dakota
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-05.1
Title	<i>Tax Incentives for Qualifying Secondary Recovery Projects</i>
Discussion	Incremental oil from secondary recovery projects is exempt from extraction taxes for five years, and incremental oil from tertiary projects is exempt for 10 years from the date incremental production commences. All oil from a qualifying secondary or tertiary recovery project is taxed at a reduced rate of 4% once the five- or ten-year exemption has expired. Non-incremental oil from a qualifying secondary recovery project, when its average production level has increased to at least 25% over normal operations for six months, is taxed at a reduced rate of 4%.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf

State	North Dakota
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-05.2
Title	<i>Tax Incentives for Qualifying Tertiary Recovery Projects</i>
Discussion	Non-incremental oil from a qualifying tertiary recovery project that produces at least 15% above normal operations for one month and continues to operate as a qualified project is taxed at a reduced rate of 4%.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001(D)(3)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Tax Exemption for Secondary Recovery Projects. The incremental production from approved secondary recovery properties approved or having an initial beginning date on or after July 1, 2000, and prior to July 1, 2009, is exempt from gross production tax for a period of five years or ending upon termination of the secondary recovery process. The operator is not required to submit capital expenses or project costs. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001(D)(4)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Tax Exemption for Tertiary Recovery. The incremental production from approved tertiary recovery projects begun on or after July 1, 1988, and before July 1, 2009, is exempt from the gross production tax for a period of 10 years or expires upon project payback, whichever comes first. Project payback provides for recovery of capital and operating expenses. Administration expenses and capital expenses of pipelines built to transport carbon dioxide to a project are excluded. The new version of this law extends the sunset from July 1, 2009, to

	July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. Tit.68, § 1357 (32)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Sales Tax Exemption for Electricity Sold for Operation of Enhanced Recovery Methods on a Spacing Unit or Lease. Electricity used for operation of enhanced recovery methods to produce oil is exempt from the sales tax beginning July 1, 2006.
URL	
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 202.054
Title	<i>Qualification of Oil from New or Expanded Enhanced Recovery Project for Special Tax Rate</i>
Discussion	The severance tax is reduced by 50% (from 4.6% to 2.3%) for oil production from new enhanced oil recovery projects and incremental production from expanded projects for 10 years after RRC certification of production response. The RRC certification is a three-step process: first, (Form H-12), the operator seeks approval and area certification for the new/expanded project; second, (Form H-13), the operator seeks RRC certification that the project evidences a positive production response (an increased rate of production attributable to the project); third, (Form H-14), the operator files an annual status report without which the credits are not validated. The application for positive production response certification must be filed within three years of project approval for secondary enhanced recovery, and within five years for tertiary recovery. The 78th Texas Legislature removed the filing deadline and made the severance tax exemption permanent.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.054

State	Utah
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(7)
Title	<i>Enhanced Recovery</i>
Discussion	A 50% reduction in severance tax is available for the incremental production achieved from an enhanced oil or gas recovery project.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102
State	Wyoming
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	EOR. In the case of tertiary production of crude oil resulting from injection of carbon dioxide gas, all Wyoming severance taxes paid on the carbon dioxide gas injected shall be deducted from and allowed as a credit against the severance taxes imposed on the oil produced by the injection.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2

New Technology Innovations

Advances in precision drilling technology are transforming oil and gas production across the United States. Operators can drill smaller holes, in more directions, deeper down, farther away, and into more places than ever before.

In the past, each well required constructing an individual site, building access roads, installing power lines, excavating a drilling pad, and other activities that altered the landscape. Today, computer-assisted directional drilling techniques make it possible to drill multiple wells from a single location. Producers can reduce their environmental footprint to one site to recover reserves that would have required the

construction of 5, 10, or even more well sites not long ago. Fewer sites equal less road traffic, reduced risk of land and water pollution, and more economical recovery of oil and gas resources. In addition to being more earth-friendly, directional drilling is wallet-friendly because reduced production costs translate into lower energy bills for consumers.

Many states are working to modify oil and gas rules that were instituted 20 to 30 years ago. These modified regulations account for new knowledge and technologies that make it possible to produce more oil and gas from fewer wells and also to accommodate production from unconventional sources that recently have become technologically and economically viable.

Lightweight Modular Drilling Rigs

Advances in manufacturing techniques and materials are driving demand for specially designed “fit for use” and modular drilling rigs that can be built for site-specific conditions.

Modular drilling rigs constructed from lighter, stronger materials are easier to transport and assemble in remote areas. These rigs require less fuel for transportation—which means a corresponding reduction in emissions—and the reduced vehicle weight makes their transport less damaging to roads and bridges. Once drilling is complete, the disassembly and removal times are reduced so the site can be restored more quickly.

Drill Bit Technology

One factor that determines the amount of time a drilling rig will spend on site is deterioration of drill bits. Depending on the types of rock they have to drill through, bits can wear out fast, and changing them takes valuable time.

Thanks to new materials and technologies, drill bits that can withstand tremendous pressure and heat are being developed by a number of sources, including major oil companies and the DOE.

Use of polycrystalline diamond drill and diamond cutter technologies developed a few years ago through industry partnerships with the DOE’s National Energy Technology Lab (NETL) have increased because they cut through rock quickly and last much longer than their predecessors.

Well Casing

Many of the steps that go into drilling and constructing a well --- whether for oil, gas, brine, or water --- serve to protect freshwater resources; however they also serve a number of other purposes. Draining a reservoir thoroughly and efficiently requires a properly constructed well. Proper casing and cement prevents oil, gas, or brine from entering fresh water zones; they also prevent fresh water from migrating into the borehole and contaminating the product. Blowout preventers, first developed in the 1920s to protect oilfield workers and prevent waste, shut off the well when excess pressure builds. An out-of-control well, or gusher, can spew oil, gas, sand, mud and rocks 200 feet into the air, causing injury, waste, and pollution. As the demand for oil and gas increased throughout the 19th and 20th centuries, improvements in well construction and design advanced rapidly as operators saw the need to prevent waste.

In the past, well diggers sometimes cased hand-dug water wells with dry masonry to prevent the well from caving in on itself. In modern wells, thick-walled steel surface casing used in conjunction with concrete stabilizes the upper formations, helps prevent blowout, and protects the well from groundwater encroachment and vice versa. Surface casing is set to depth according to regulations set by the states. Field rules take into account the geology and hydrology in a given region --- including the depth of unconsolidated soil and rock and the presence of freshwater zones --- to determine the depth and placement of the casing and seals necessary to protect groundwater. States use engineering criteria in conjunction with data collected over decades of experience from a variety of sources and agencies to determine the standards to which a well must be constructed.

Texas and Oklahoma provide good examples of how states set requirements for surface casing. In Texas, operators are required to obtain a groundwater protection recommendation letter from the Texas Commission on Environmental Quality (TCEQ). The purpose of this letter is to provide the Rail Road Commission of Texas, (locally referred to as the “RRC”), which regulates the oil and gas industry in Texas, with the estimated depth of usable-quality groundwater and additional isolation zones that should be protected in a well/boring or project area. Prior to issuing the permit, surface casing geologists analyze the operator’s casing program using data derived from driller’s logs, water-wells, subsurface maps, and other sources to determine if the proposed plan provides adequate protection to groundwater.

Wayne Wright, manager of field operations for the Oklahoma Corporation Commission, says that Oklahoma rules dictate the depth to which surface casing is set, “but we get a lot of requests for

alternate casing plans, not to reduce the surface casing, but to set it deeper.” Modern drilling tools are so fast that it is less expensive for an operator to set and cement extra casing in a well than it is to stop the drilling crew early in the shift, call in the cement crew and wait for the concrete to cure for 8 hours. Additionally, a larger bit is used to drill the initial hole, so a deeper surface casing allows more room to work.

In one Oklahoma field, drillers set surface casing at around 1,500 feet to protect the base of treatable water, added an intermediate casing string through a high-pressure zone at 7,500 to prevent a blowout, and added a production casing to the bottom of the hole.

Texas Commission on Environmental Quality (TCEQ) Surface Casing Program

Operating through the TCEQ, the Surface Casing Program prepares groundwater protection recommendation letters upon request for oil and natural gas producers.

From its beginning in 1955, the surface casing team has used a variety of data to generate its geological opinions concerning the groundwater protection zones in Texas: geophysical logs (electric logs), drillers’ logs, water-well data, geologic data, and subsurface structure maps.

These data have been indexed using historic county survey maps drawn on linen that show the location of existing oil and gas wells. Once a new well is located, the data from nearby wells are reviewed by a surface casing geologist to determine the base of usable-quality groundwater and any required isolations.

More recently the surface casing team is beginning to replace the linen county maps with digital, computer-generated maps. The surface casing geographic information system (SC GIS) incorporates the records for existing oil and gas wells into a spatial database to produce the computer-generated maps. This

tool allows geologists to overlay subsurface geologic and water-well data for more efficient analysis.

The new technology allows the surface casing team to provide more exact data about the base of usable-quality groundwater in Texas.

The SC GIS is especially useful in areas of Texas where adjacent well logs are not available and the surface elevations are highly variable. The data can also identify drilling hazards, like waste plumes.

In time, these digital maps will be available on the Texas Natural Resource Conservation Commission website. Other duties of the surface casing team include assisting the RRC and other TNRCC staff with difficult subsurface geology problems related to the contamination of usable-quality groundwater (Texas Natural Resource Conservation Commission, 2001).

America's First Casing

A brine well built between 1806 and 1808 as a commercial enterprise for two brothers was cased with a "17-foot-long, hollow sycamore tree trunk or 'bee gum', about 4 feet in diameter, through the surface beds to solid rock... At this point they needed a casing to protect the strong salt solution from contamination by higher, weaker brines. They cut a slender sapling about 3 inches in diameter, or somewhat larger on one end, and split it down the middle into two halves... inserted them into the well bore... They used rag wrappings at the bottom of the pole-tube to shut off seepage waters from above... Insofar as

known from the available literature on such subjects, this was the first well drilled and cased in America. (Brantley, 1971)

Coiled-Tube Drilling

Although coiled-tube drilling is not new, it is typically used during workover service or stimulation of problem wells rather than for drilling exploratory and development wells. Thanks to innovations such as microhole drilling tools and miniaturized sensors, use of coiled-tube drilling is increasing.

In areas where coiled-tube drilling is appropriate, the flexible, continuous tubing --- which is wound like thread on a large spool --- has numerous advantages over traditional drilling, which uses 30-foot lengths of steel pipe.

Besides being lighter and easier to transport than steel pipe, coiled tubing requires a much smaller drilling rig. In fact, some rigs are so small they can be towed behind a pickup truck. Surface impact from transportation is greatly reduced, the amount of land required for the drill site is much smaller, the time from rig set-up to well completion is drastically reduced and overall costs are as much as 25% to 35% less than traditional drilling.

Another environmental benefit of choosing coiled-tube drilling over conventional drilling is that the system requires less drilling fluid. Because it uses a closed-loop system, the overall environmental footprint is smaller. The volume of water and drilling mud transported to the drill site is minimized and disposal of correspondent volumes of waste is eliminated as an issue. Minimizing the amount of potential waste products is not only better for the environment; it reduces one of the most expensive elements of oil and gas production and reduces the risk of spills and other hazards.

Slimhole and Microhole Technologies

Shrinking computer chips are enabling researchers to develop increasingly sophisticated miniature measurement while drilling (MWD) tools and other downhole electronics that send back real-time data via wireless or fiber optic technologies. Used with small-scale drill bits and coiled tubing, these miniature tools can make a big difference in the amount of time spent onsite and the amount of drilling waste produced.

The decreased size of slimhole and microhole technologies brings down both the financial and environmental costs of coiled tube drilling even further. Traditional drill bits are as large as 12.25 inches in diameter, but slimhole drill bits must be less than 6 inches in diameter. Microhole technologies reduce the size, and the environmental footprint, as much as 75 percent.

Shorter drilling times, smaller drilling crews, lower emissions, and dramatically less drilling waste are all small steps that can add up to big reductions in environmental impacts.

Synthetic Drilling Fluids

Drilling fluids serve several important functions: they act as lubricants and cooling agents to counteract the effects of friction as the metal bit works against hard rock. They maintain pressure in the well; provide buoyancy for the weight of the steel pipe; stabilize the rock surrounding the hole; and carry drill cuttings to the surface. Drilling fluids also affect the ability of downhole measurement tools to relay information.

Operators choose drilling fluids, often referred to as “mud,” for their ability to perform the jobs listed above according to specific downhole environments. Water-based muds are most commonly used. However, water-based muds cannot handle the job in many of today’s unconventional oil and gas plays.

Drillers can use oil-based mud to overcome complex geology and extreme temperatures in unconventional wells, but oil-based mud drilling fluids create challenges due to increased costs associated with environmental protection. The drilling waste is more difficult, and therefore more expensive, to dispose of, and regulatory compliance might add to that expense. Some states forbid the use of oil-based mud unless the operator obtains a variance due to unusual circumstances.

Increasingly, operators are turning to high-performance water-based muds and synthetics formulated to perform particular functions based on the chemical and physical properties of a given well. Additives, such as micronized deformable sealing polymers create barriers between pressure zones and address instability of shale formations and other site-specific issues. (File Waste Hierarchy)

The need for muds that can withstand the extreme high temperatures and pressure of offshore drilling without the environmental impact of oil-based muds has yielded significant development of synthetic-based drilling fluids. Although operators use synthetic-based muds extensively offshore, they generally choose water-based products for drilling onshore.

Pneumatic Drilling

In certain areas, depending on the rock type encountered, drillers substitute air or other gases for drilling fluids. Bringing debris up from downhole with air, rather than drilling muds, is an environmentally friendly alternative that reduces transportation and disposal of drilling waste.

Imaging Technologies – Painting a Picture of the Subsurface

The ability to “see” underground using seismic, gravity, and electromagnetic imaging technologies is an important aspect of oil and gas exploration and is also an important tool used to design wells. By recording changes in the way energy moves through the earth, imaging technologies create a picture of subsurface formations that scientists use to develop accurate models to locate promising targets and then develop them fully with less risk to the environment.

The traditional method of gathering seismic data places geophone receivers in strategic locations in the area to be explored followed by crews that create sound waves using explosives or specially equipped trucks that strike the ground with a steel plate. That method concerns environmentalists who worry about possible surface disturbance, noise, and interference with animal habitat. New to the scene are cableless seismic instruments that lessen, but do not eliminate, the need for the extensive network of cables that crews lay to detect and collect seismic data. Cableless seismic technologies are especially helpful in sensitive areas such as wetlands and other critical wildlife habitats, and in urban settings that would be affected by the truck traffic and by the personnel required for traditional seismic surveys. Another benefit of cableless seismic activity is the ability to gather data from more channels, which creates a more accurate and detailed picture of geologic formations. According to Larry Denver, chairman and CEO of Ascend Geo, a seismic company, “The early adopters of the cableless approach to seismic are using it generally for one of three reasons:

- (1) They want to lower costs.
- (2) They need flexibility, e.g., ability to shoot passive seismic, 4-D, combine multi component and standard arrays.
- (3) They are confronted with environmentally sensitive issues, such as taking cables through a town or a protected environment. (Kleppe, 1976)

An even less invasive technique is “passive seismic” that interprets the sound energy from the naturally occurring, dynamic movement of the earth’s crust rather than created noise from explosives or earth-pounding machinery. This technology is gaining favor in areas such as Colorado’s Rocky Mountains region because it has fewer permitting requirements due to its less invasive nature.

With the help of sophisticated computer modeling applications, 3-D and 4-D seismic --- which uses 3-D seismic data collected over time --- are becoming popular tools for exploration and development. Some companies have built high-tech theaters equipped with the latest audio and visual equipment to create a virtual underground tour.

These modern imaging technologies assist operators in engineering site and drilling plans that allow efficient reservoir drainage while protecting environmentally sensitive areas such as wetlands and critical animal habitats. Aerial imagery data studied in relation to weather patterns and other site-specific data can help planners determine animal migration routes, area conditions such as water bodies, drainage patterns, and other important information they can use to reduce the footprint of their operations. 4-D seismic allows operators to understand how rocks in a given formation naturally fracture so that precision fracturing plans for well stimulation can be developed to increase recovery while protecting groundwater.

Table 14. Rules and Regulation for New Technology Usage

State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1003
Title	<i>Tax Incentives -- Increased Volume by New Research Technology</i>
Discussion	Incremental production oil due to application of new research technologies approved by the Oil and Gas Commission is exempt from the severance tax.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1003.htm
State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § B-42

Title	<i>Seismic Rules and Regulations</i>
Discussion	This amendment clarified the area covered by a permit with respect to 2-D and 3-D seismic methods. 2-D – permit area is ½ mile on each side of line location, referred to as “2-D seismic line corridor.” 3-D – permit area is based on outline of designated area where shoot will occur. The rule expressly states many operation requirements that previously were located only on the issued permit and also imposes additional operation requirements that were not included in the issued permit. The rule clarifies how notice is to be given, and who is entitled to notice prior to commencement of seismic operations. Entitled to notice are operators within the “area”, surface owners, and surface occupants who are not owners.
URL	
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001(J)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Three-Dimensional Seismic Technology. Operators producing oil, natural gas, or oil and natural gas from a well, the drilling of which is commenced after July 1, 2000, and prior to July 1, 2009, located within the boundaries of a three-dimensional seismic shoot and drilled based upon three-dimensional seismic technology, may apply to the Tax Commission for a rebate of gross production tax paid in the previous fiscal year upon qualifying such well with the Oklahoma Corporation Commission. Qualified projects shall be exempt for a period of 18 months from the date of first sale for seismic shot prior to July 1, 2000. Projects shot after July 1, 2000, and prior to July 1, 2009, shall be exempt for a period of 28 months from the date of first sale. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 202.061
Title	<i>Tax Credit for Enhanced Efficiency Equipment</i>
Discussion	Provides for a severance tax credit for enhanced efficiency equipment installed on marginal oil

	wells between September 1, 2005, and September 1, 2009. "Enhanced efficiency equipment" means equipment used in the production of oil that reduces the energy used to produce a barrel of fluid by 10 percent or more when compared to commonly available alternative equipment. The term does not include a motor or downhole pump. Equipment does not qualify as enhanced efficiency equipment unless an institution of higher education approved by the comptroller that is located in this state and that has an accredited petroleum engineering program evaluated the equipment and determined that the equipment does produce the required energy reduction.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.061

Waste Management

Proper management of waste products is arguably the most important step oil and gas producers take to reduce the impact of the industry on the environment. Improper disposal can damage surface and groundwater resources, harm plants and animals, pollute the air, and otherwise harm the environment. State oil and gas regulators focus a considerable amount of their time and resources to ensure that oil and gas operators handle waste properly.

Four types of waste are produced during oil and natural gas exploration and production operations. They include:

- (1) Produced water — the saline water brought to the surface with oil and gas.
- (2) Drilling waste — the rock cuttings and fluids that are produced from drilling a new wellbore into the subsurface.
- (3) Associated wastes — a broad category of small volume waste streams, including human and food waste associated with living in remote locations, that encompass all other types of wastes uniquely associated with oil and natural gas production.
- (4) Industrial wastes — the wastes generated at well sites that are not uniquely associated with oil and gas production. Examples include paint, spent solvents, and packaging materials.

For recycling to make sense a number of variables have to be in place:

- (1) If the recycled product is meant to replace another product, it has to be comparable in quality and price to the original product.
- (2) There has to be a market for the recycled material.

(3) The recycled material has to be available in sustainable quantities.

A Louisiana waste-management company found a way to turn recycled drill cuttings into a profit in east Texas. U.S. Liquids of Louisiana (USLL) believed that it could clean up and recycle drill cuttings, which consist primarily of bedrock aggregates from downhole, into road and levee construction materials.

Market research showed that Texas, which was moving forward with major infrastructure construction and upgrades in the southern part of the state, was dealing with shortages of some road construction materials, high prices for rock and asphalt, and costly transportation for products that had to be trucked in from as far away as southern Mexico.

Identifying the Texas Department of Transportation (TXDOT) as a potential market, the company researched state regulations to determine the necessary steps to get recycled drilling waste approved for use as roadway construction material.

Finding the Railroad Commission of Texas (RRC) rules on recycling oilfield waste ambiguous, the company proposed rules that more clearly defined “recyclable product.” The recently amended rules take some of the liability off the producer, who previously was responsible for the waste from “cradle to grave” regardless of its final use, and placed responsibility on the recycler to produce a product that would safely fulfill its intended purpose.

While working with the RRC to update its rules to provide incentives for recycling through guidance and clarity, the waste management company set to work developing a process for recycling drilling wastes into a product that could stand up to the engineering and safety standards required by TXDOT.

The result was clarification of RRC’s rules regarding recycling, which USLL followed to provide Texas with a sustainable source of high quality road construction material at a reasonable price. A significant volume of oilfield waste has been transformed into a valuable product.

Reducing and Reusing Emissions

Escaped gases, commonly called “fugitive emissions,” are a source of air pollution associated with oil and gas production. The gas byproduct can escape into the air unintentionally through leaks in pipes or equipment. In some cases, small quantities (called “stranded gas”) are released (“vented”) or burned (“flared”) as a safety measure to prevent buildup of flammable gas.

Within days of taking office, President Barack Obama signed a memorandum that grants California and other states the right to set their air quality standards above those set by the federal government. While the oil and gas industry might believe that more stringent emissions regulations will cause an undue burden, the issue illustrates that the states do have the will to ensure environmental protection above and beyond what the federal government deems appropriate.

On-site Use of Produced Oil/Gas

States offer incentives for on-site use of produced oil and gas to reduce the necessity for venting and flaring or other waste management techniques. On-site use, as opposed to venting or flaring, helps to lift the resource, thus encouraging the recycling of oil and natural gas that otherwise would have been considered a waste product. Use of produced oil and natural gas reduces emissions while allowing for enhanced recovery of the oil and natural gas that might otherwise be left in the reservoir as a waste stream.

Table 15. Incentives for On-site Use of Produced Oil / Gas

State	Alabama
Category	Tax incentive
Citation	Ala. Code § 40-20-2(b) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Exempts from privilege taxes natural gas lawfully injected for the purpose of lifting oil or gas.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
State	California
Category	Tax incentive
Citation	Cal. Pub. Res Code § 3403
Title	<i>Charge for Gas</i>
Discussion	Natural gas used on-site for pressure-maintenance or other producing operations is exempt from assessment.

URL	
State	Florida
Category	Tax incentive
Citation	Fla. Stat. Title XIV, § 211.027 (1)
Title	<i>Exemption for On-site Use of Production</i>
Discussion	Oil and gas produced and used on-site are exempt from severance taxes.
URL	
State	North Dakota
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-02-16
Title	<i>Exemption for Lease Use Gas</i>
Discussion	Services (No Trigger). Natural gas used on-site in the production of oil or gas is exempt from production taxes.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-02.pdf
State	North Dakota
Category	Tax incentive
Citation	N.D. Cent. Code § 38-08-06.4
Title	<i>Commission Shall Determine Market Demand and Regulate the Amount of Production</i>
Discussion	Stranded Gas Usage. Gas burned at the well site to power an electrical generator that consumes at least 75% of the gas from the well is exempt from the gross production tax.
URL	http://www.legis.nd.gov/cencode/t38c08.pdf

Source Reduction

Energy companies in Colorado are discussing working together to develop comprehensive drilling plans for larger areas, as opposed to planning their individual sites. Their goal of identifying potential

effects and working together to address issues is encouraged by the state's new rules that streamline the approval process for drilling permits when companies work together to mitigate their environmental footprints. (Pros, cons offered on oil and gas regulations : Colorado Government , 2009).

Coiled-tube and microhole drilling are examples of source reduction and waste minimization technologies. Because the coiled tubing is small compared to traditional drill pipe, the amount of drilling fluids required is reduced significantly. Also, because of its reduced size, energy consumption and any resulting emissions are minimized. Finally, the volume of drill cuttings and other waste products is considerably less than with traditional drilling equipment. The problem of methane emission due to natural gas loss and leakage is an almost incalculable source of greenhouse gases nationwide. Yet this issue is mostly addressed through voluntary self-regulation, meaning that education is a key method for reaching those who are unaware of cost-effective technologies and practices. Education resulting in technological and behavioral changes to this problem would prevent pollution at the source, reduce the emission of a greenhouse gas, and conserve valuable energy for both the environmental and economical health of America.

Green-to-Black

Through its extensive contacts, the IOGCC is engaging state-based industry, industry advocates, and state officials to release technological and best management practices information to those who could benefit from it. Promoting efficient materials management in natural gas production is an exciting opportunity due to the availability of inexpensive technological upgrades. These upgrades are an incredibly cost-effective means of preventing billions of cubic feet of natural gas, composed mostly of the greenhouse gas methane, from being lost into the atmosphere. In many instances, these technologies also provide a remarkable return on investment to the producer.

This differs from other conservation programs in that many of them are aimed at the national offices of large corporations. In contrast, the high number of marginal wells and small oil and gas companies in states such as West Virginia and Virginia require a more decentralized approach to reaching those persons who are decision-makers for local and regional operations.

The opportunity to stem the emission of natural gas-related methane occurs at three points in the natural gas production and distribution process: (1) replacement or repair of faulty or outdated equipment; (2) efficient production systems; and (3) other best management practices (BMPs). As with

the technology upgrades, almost all conservation-friendly production technologies provide a return on investment to the producer.

While education produces results, independent producers and operators simply cannot justify large research and development expenditures. For that reason, the program is essential to reaching these independent producers and operators so they will receive free training and can do their part to prevent methane emissions related to natural gas production. This free training will give them the knowledge they need regarding the replacement or repair of faulty or outdated equipment, efficient production systems, and other best management practices.

Advances in technology make it both possible and economical for producers to capture gas that was previously lost to the atmosphere. Vapor Recovery Units (VRUs), capture approximately 95 percent of the flared or vented gas and direct it into pipelines or other beneficial uses. The captured gas can be used to fuel onsite equipment, such as turbine power generators, or marketed along with other hydrocarbon products to create a win-win solution for producers and the environment.

Another important advancement is the introduction of Leak Detection and Repair (LDAR) programs that use mobile infrared technology to spot previously undetectable levels of escaped gases. Infrared LDAR programs save time and money, and protect the environment by allowing maintenance teams to repair minor leaks before they become significant sources of emissions.

Stranded Gas

Almost all oil produced has some gas commingled with the oil. This gas may be separated at the wellhead (casinghead gas) or at surface facilities near the well. In some cases, the gas can be delivered to natural gas pipelines. In many others, the gas is too strong, or too weak, or too little, or too far from a pipeline. This gas is flared, vented, or injected back into the ground (Interstate Oil and Gas Compact Commission, 2008).

In 2006, the IOGCC, working in cooperation with the California Oil Producers Electricity Cooperative (COPE), the California Energy Commission (CEC) and the California South Coast Air Quality Management District (SCAQMD), conducted a research program aimed at using stranded gas, which is frequently burned off into the atmosphere, as the fuel for distributed generation electricity to extend the life of marginally producing wells. The program, conducted at St. James Field near Los Angeles, was able to keep marginal wells producing enough oil in a single day to provide the gasoline for a person driving 40

miles per day roundtrip to get to work for 3.3 years; to recapture enough natural gas to supply 75 homes with electricity; to reduce nitrous oxide emissions by 300 tons per year; and to reduce greenhouse gases by 120,000 tons per year of CO₂ equivalent.

Pipeline Gathering Systems

An integral part of the natural gas transportation network is the “gathering system.” A smaller pipeline is connected at a producing well, and converges with pipes from other wells where it is processed and treated, and ultimately directed to the mainline transmission grid. Gathering systems can mitigate venting and flaring by capturing stranded gas at the wellhead.

Venting / Flaring of Gases

Venting or flaring of gas reduces the costs associated with production. By allowing the venting or flaring of natural gas, states are helping to keep the costs of production down. While venting or flaring is traditionally considered waste, some states will require that royalties be paid on the vented gas after a specified period of venting or flaring. As mentioned above, the use of produced oil or natural gas also limits venting by encouraging use of oil or gas that would be otherwise wasted in recovery operations. Where recovery operations are not feasible or are cost prohibitive, especially for smaller producers, allowing venting keeps costs down and keeps wells flowing.

Table 16. Laws and Regulations for Venting and Flaring of Gas

State	Kansas
Category	Laws and Regulation
Citation	Kan. Stat. Ann. § 55-102
Title	<i>Permitted</i>
Discussion	Venting and Flaring of Gas. This statute change allows venting or flaring of gas from natural gas wells (including gas from coal seams) when approved by the Kansas Corporation Commission. The venting or flaring of gas always has been associated with waste and, therefore, was not allowed except for associated casing head gas from oil wells.
URL	

State	Michigan
Category	Laws and Regulation
Citation	Special Order No. 3-71, amended
Title	<i>No Flare Order</i>
Discussion	Mich. Comp. Laws § 324.61501 lays out the rules regulating waste of oil and gas in Michigan. Flaring of gas is allowed at specified volumes.
URL	http://www.michigan.gov/documents/deq/ogs-cause-1971-03-SO_266597_7.pdf
State	Michigan
Category	Laws and Regulation
Citation	Supervisor of Wells Order No. 18-2007
Title	
Discussion	Mich. Comp. Laws § 324.61501 lays out the rules regulating waste of oil and gas in Michigan. Flaring of gas is allowed at specified volumes.
URL	http://www.michigan.gov/documents/deq/ogs-oilandgas-spacing-albionscipio_258038_7.pdf
State	North Dakota
Category	Tax incentive
Citation	N.D. Cent. Code § 38-08-06.4
Title	<i>Flaring of Gas Restricted - Imposition of Tax - Payment of Royalties -Industrial Commission Authority</i>
Discussion	Flared Gas. Gas produced with crude oil from an oil well may be flared during a one-year period from the date of first production from the well without paying royalties and taxes. A producer may obtain an exemption to the one-year period after showing that connection of the well to a natural gas gathering line is economically infeasible or that a market for the gas is not available and that equipping the well with an electrical generator to produce electricity from gas is not economically feasible.
URL	http://www.legis.nd.gov/cencode/t38c08.pdf
State	Texas

Category	Tax Incentive
Citation	HB 2982
Title	<i>AN ACT relating to the transfer of the regulation of injection wells used for in situ uranium mining from the Texas Commission on Environmental Quality to the Railroad Commission of Texas.</i>
Discussion	See Tex. Tax Code Ann. § 202.058
URL	http://www.capitol.state.tx.us/tlodocs/79R/billtext/pdf/HB02982I.pdf
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 201.058
Title	<i>Incentive to Market Previously Flared or Vented Casinghead Gas</i>
Discussion	If an operator markets casinghead gas that had previously been released into the air (vented or flared) for 12 months or more in compliance with Commission rules and regulations, the operator may receive a severance tax exemption on that gas for the life of the well.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.201.htm
State	Texas
Category	Tax Incentive
Citation	Tex. Tax Code Ann. § 201.059
Title	<i>Credits for Qualifying Low-Producing Wells</i>
Discussion	See Tex. Tax Code Ann. § 202.058
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.201.htm#201.059
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 202.058
Title	<i>Credits for Qualifying Low-Producing Oil</i>

Discussion	Flared Casinghead Gas. If an operator markets casinghead gas that previously had been released to the air (vented or flared) for 12 months or more in compliance with RRC rules and regulations, the operator may receive a severance tax exemption for that gas for the life of the oil well or lease.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.201.htm
State	Wyoming
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	Natural gas that is vented, flared or reinjected has no value and is exempt from taxation.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2

Comprehensive Drill Plan Development

The oil and gas industry is using technology and creative thinking to find ways to minimize disturbance to the environment according to the needs and characteristics of specific areas. These innovative practices are especially important in sensitive wildlife habitats such as state and national parks.

Important to the process of development is incorporating the input from affected municipalities, landowners, ranchers, farmers, environmentally focused non-government entities (NGOs), and other concerned citizens. Operators are encouraged to develop plans that will reduce the overall footprint of drilling, reduce surface damages to the minimum, and blend into the environment. Factors to take into consideration are possible impacts on soil, water resources and water management, noise pollution, construction activities, power, agricultural and ranching activities, rural and scenic wildlife, sensitive habitat, and archeological sites.

Regulatory officials use formal and informal methods to encourage comprehensive drill plan development. Incentives encourage use of technologies such as horizontal drilling. Public hearings and

comment periods are held to receive input from citizens about permits and rulemakings. Informally, regulatory agencies encourage cooperation and collaboration between all parties involved to find the best solutions to meet a community's needs.

In western Colorado, Shell is experimenting with freeze-wall technology to protect groundwater during a process that uses electric heaters inserted into oil shale rocks to convert kerogen, the organic precursor to oil, into high-quality fuel. The in-situ process heats the rock slowly over a number of years mimicking the thermal process that converts organic material to hydrocarbons. Questions remain as to the net environmental footprint this quick --- relative to geologic time --- yet energy intensive fuel production method will have.

Ice Roads, Drilling Pads, and Insulating Panels

Alaska's oil and gas industry protects the fragile tundra of the North Slope by constructing ice roads and drilling pads that melt, leaving behind little evidence of their existence. Workers cover packed snow with either seawater from the ocean or freshwater gathered from nearby lakes, whichever is most appropriate for the area's ecological balance. Once the water freezes, road graders scar the surface to allow vehicle tires to gain traction.

Although ice roads have been in use for several years, the more recent addition of prefabricated reusable insulating panels has extended drilling seasons by several weeks and can last through multiple seasons. This significantly reduces environmental impact because the intense activity of drilling is limited to a single season if possible, and for areas that require access over multiple seasons, road construction disturbance does not have to begin anew each year. Ice roads are also important because they help

operators avoid disturbing animals during mating and migratory seasons. Alaska's Alpine Field, which began production in 2000, was developed with no permanent roads.

Using ice has eliminated the need to use gravel for exploration operations that may not end up resulting in production (i.e., dry holes or other temporary tests). Beyond limiting road construction activities, using ice as a construction material for drilling sites reduces the 8 to 10 acres of tundra that were potentially damaged for storage, crew's quarters, and other onsite functions. Once the ice melts, the land remains virtually unscathed.

Helicopters and Unmanned Aerial Drones

In places where building roads is impractical or impossible, equipment is brought onsite using helicopters. Helicopter transport significantly reduces the number of trees that must be cleared for drilling in heavily forested areas.

Some companies use unmanned aerial drones to monitor pipelines in regions that have extreme weather and low populations. Remote sensing technology sends data, including pipeline pressure and equipment integrity, across the country or around the world to engineers who keep an eye on equipment in multiple regions from a central command station.

On-site Housing

Rather than build heavy-duty roads that end up filled with constant traffic, oil companies sometimes build temporary onsite housing facilities for their employees. Shuttles carry work crews on- and off-site to minimize traffic. These temporary towns, called "man camps," include dining and laundry facilities. Water and sewage treatment occurs on-site.

There are environmental tradeoffs inherent in the man camp housing model. Even a temporary town has an environmental impact on the immediate vicinity because of noise and light pollution. However, reduced traffic, light-duty road construction, reduced vehicle emissions, and avoidance of animal migration routes and breeding grounds make the camps viable options under the right circumstances.

Horizontal and Directional Drilling

Horizontal Drilling

"...a technique whereby the well is initially drilled vertically and then turned and drilled horizontally at an angle to the vertical of anywhere from 79 degrees to 104 degrees. It encompasses high-angle directional drilling of boreholes with lateral penetration through productive reservoirs. Horizontal drilling allows the wellbore to follow the desired formation. (Williams, Meyers, Martin, & Kramer, 2006)

Begun in the mid-20th Century, directional drilling has been used increasingly in recent years as drillers gained the technology to consistently control the drill bit.

Recent innovations such as steerable rotary downhole motor assemblies and sophisticated MWD tools have made directional drilling an increasingly popular alternative to vertical drilling. Today, drillers use laptop computers to guide the drill bit toward the intended target while adjusting constantly to real-time data gathered with downhole sensor technology.

Directional drilling techniques include extended reach drilling, horizontal drilling, and multilateral drilling. These technologies have opened opportunities to develop resources that previously were unrecoverable such as tight sands, oil shale, and natural gas from coal seams.

The environmental benefits of directional drilling are numerous. The ability to drill long distances—the record stands at around 8 miles—gives oil producers the ability to drain reservoirs that lie under lakes, wetlands, animal migration routes, and even cities, without disturbing the surface.

A contentious issue for the eight states bordering the Great Lakes is the banning of directional drilling under the lakes by the government. On one side of the issue are those who believe that oil and gas regulation is best handled by the states and see the ban -- originally a temporary restriction placed in 2001, later enacted into law with the Energy Policy Act of 2005 -- as a violation of states' rights. Others see it as critical to wildlife protection because state regulations on the oil and gas industry are not uniform. Canada drills under the lakes and has done so for a number of years.

Alberta's Energy Resources Conservation Board (ERCB) encourages the use of directional and horizontal drilling, and this technology has resulted in exponential increases in production. For example,

the use of such technology has created a new resource development of in-situ oilsands through the use of Steam Assisted Gravity Drainage technology (SAGD) and Cyclic Steam (CS). At present, this has resulted in daily production from in-situ oilsands of 640,000+ barrels a day (forecasted over the next 10 years to move to 1.4 million barrels – about 2% of today's total world oil production). The ERCB has some specific success stories from the use of this technology to increase oil and gas production in other areas of the province. The application of the technology has several benefits, from resolving disputes with landowners over the location of drilling to ensuring maximum production to obtain orderly development. The technology has not only been applied to in-situ situations but also to more marginal production such as methane from coal and shale gas.

Horizontal drilling conserves resources because the wellbore makes contact with more area of the source rock, allowing greater recovery of the oil in place. Another benefit is that in areas with multiple producing formations, the original borehole can be used to drill wells at varying depths and in multiple directions. In the Barnett Shale trend in North Texas, more than 11,000 wells have been drilled in the last decade, the vast majority of which are horizontal completions.

Because multiple horizontal holes can be drilled from one borehole, the original vertical depth of the hole must be drilled only once, so the volume of cuttings to be disposed of is greatly reduced when compared to the amount generated from multiple discrete wells.

The advent of horizontal drilling posed a challenge to the traditional concept of drilling units and well location under Michigan law. A drilling unit is defined as a tract of land of a prescribed size and configuration that can be drained efficiently by one well. The well must be drilled in a prescribed location or window within the unit. Exceptions to drilling units may be granted, but variances require a public hearing. The concept of drilling units has served well for the development of traditional vertical and directional wells. However, it severely limits the options for horizontal wells.

In 1996, Michigan promulgated new rules for oil and gas exploration and production operations. Among other things, the new rules allow for voluntary combinations of two or more drilling units for the drilling of a single well. Such a well is exempt from prevailing bottom-hole location requirements provided that no part of the productive interval is closer than 330 feet from the combined unit boundary. This provides the flexibility to drill long horizontal wells without having to go through a burdensome and time-consuming hearing.

Under a special well spacing order, bottom-hole locations for Devonian shale gas wells within a multiple-well development project must be 1,320 feet apart. Michigan established a policy defining “high-angle holes” (defined as more than 75 degrees from vertical) as horizontal wells that are exempt from the setback requirement. This has enhanced the horizontal drilling opportunities in some of these developments. Michigan’s rules and policies, formulated with input from all stakeholders, are broadly supported.

North Dakota’s Bakken Horizontal Well Incentive reduced the tax rate of 2% of the gross value of the oil extracted at the well for the first 75,000 barrels of oil produced during the first 18 months after completion from a horizontal well drilled and completed in the Bakken formation. The incentive has been identified as a key reason for the increase in drilling activity that occurred during the first half of 2008.

***Horizontal Drilling Changes the Face of Oil and Gas
Laws Across the Country***

Oklahoma defines a horizontal well as a well drilled, completed or re-completed in a manner in which the horizontal component of the completion interval in the geological formation exceeds the vertical component and the horizontal component exceeds a minimum of 150 feet in the formation. Literally, the well is entered vertically and then at a specified depth, the drill pipe turns to start drilling horizontally. In Oklahoma, there are a total of 3,237 oil and gas wells. Of that number, 928 (28.6%) of the wells are horizontal wells.

Horizontal drilling is attractive for a number of reasons. By drilling horizontally, operators are able to tap into more resources as opposed to just drilling vertically. Environmentally, horizontal drilling has a smaller footprint than normal drilling operations – where you might have five drilling rigs drilling into a common source of supply, horizontal drilling allows operators to use one rig to get to oil and gas that was previously

unreachable without the use of multiple rigs. Economically, fewer rigs means there is less overhead for the operator and when it costs less to produce, all parties (royalty interest owners, working interest owners, etc.) benefit. Horizontal drilling is also being used to great effect in the vast shale deposits found throughout the United States.

The increase in horizontal drilling activity has increased the number of legal issues surrounding it. Spacing issues present questions about what information needs to be included in the drilling application, there are issues with the administrative process associated with application filing, and there are fundamental definition issues as to exactly where the well is located. There are also questions pertaining to how to deal with overlapping vertical and horizontal units. There are pooling disputes with horizontal drilling, too. Issues such as the expiration of the horizontal units, what zones of production are held at any point in time, and what is the legal effect if the actual lateral length is shorter than the projected lateral length. Horizontal drilling also raises unitization issues; specifically what happens when the horizontal drilling operation crosses multiple common sources of supply.

Just as horizontal drilling is changing the face of the drilling industry, horizontal drilling is also changing the face of oil and gas law. The issues surrounding horizontal drilling will require creative thinking on all levels – legal, business, and public policy. The economic incentive is basic and the environment is friendly toward an amicable resolution of these issues. The future of horizontal drilling is overwhelmingly

positive but there are some issues that will require creative lawyers to resolve effectively.

Table 17. Horizontal Drilling Incentives

State	Louisiana
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633
Title	<i>Rates of Tax</i>
Discussion	The statute reduces severance taxes on the following categories of wells to stimulate exploration and development of horizontal, new discovery, deep gas, or condensate wells. Severance taxes for oil or gas from horizontally drilled wells or recompletions are suspended from the date of first production for a period of 24 months (extended in 1996 Act 16 and in 1998 Act 7), or until payout of the well cost, whichever comes first. Payout of the well cost shall be determined by the Department of Natural Resources.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399
State	Montana
Category	Tax incentive
Citation	Mont. Code Ann. § 15-36-304 (1995)
Title	<i>Production Rates Imposed on Oil and Natural Gas - Exemption</i>
Discussion	Horizontally Recompleted Wells. Horizontally recompleted oil wells pay a reduced production tax rate on the incremental production for the first 18 months of production after recompletion. This incentive is suspended when the price of West Texas Intermediate crude oil exceeds \$30 per barrel for a calendar quarter and reactivates when the price of oil drops below \$30 per barrel. Wells that have not produced for five years or more are treated, for tax purposes, as new wells (see also: Horizontal Wells section). Horizontal Wells. Production taxes for oil or gas wells that are completed horizontally or for horizontally recompleted oil wells that have not been producing for five years or more are exempt from production taxes, except for the 5% resource indemnity tax for the first 18 months of production.

URL	http://data.opi.mt.gov/bills/mca/15/36/15-36-304.htm
State	North Dakota
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-06
Title	<i>New Well Exemption for Horizontal Wells</i>
Discussion	Horizontal Wells. Production from new horizontal wells drilled and completed after April 27, 1987, but before April 1, 1995, is exempt from extraction taxes for the first 15 months following well completion, and is then taxed at a rate of 4% thereafter. Oil produced from a horizontal well drilled and completed after March 31, 1995, is exempt for the first 24 months. Affected by price trigger. The NDPC attributes significant increases of drilling activity to this incentive, plus new technology, new finds and good oil prices. The NDIC's statistics show an increase in permits and a decline in the rate of well plugging. As an unexpected benefit, while pursuing new horizontal plays, new plays and new fields have been discovered.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
State	North Dakota
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-10
Title	<i>Horizontal Re-entry Well Exemption</i>
Discussion	Horizontal Re-entry Well Exemption. Oil produced from a horizontal re-entry well during the first nine consecutive months starting with the date the well was re-completed as a horizontal well is exempt from the oil extraction tax. The designation of a horizontal re-entry well is given to a well initially drilled and completed as a vertical well which is re-entered and re-completed as a horizontal well after March 31, 1995. This designation may also apply to the re-entry and recompletion of a vertical well that is classified by the NDIC as a dry hole. Affected by price trigger.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
State	North Dakota
Category	Tax incentive
Citation	N.D. Cent. Code § 57-51-1.3
Title	<i>Horizontal Well</i>

Discussion	Horizontal Well. The first 75,000 barrels of oil produced during the first 18 months after completion, or \$4.5 million gross value of oil produced, from a horizontal well drilled and completed is subject to a reduced tax rate of 2% of the gross value at the well of the oil extracted. Affected by price trigger.
URL	http://www.legis.nd.gov/cencode/t57c511.pdf
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001(E)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Horizontally Drilled Wells. Wells qualifying for this rebate must be drilled in a manner that encounters and subsequently produces from a geological formation at an angle in excess of seventy (70) degrees from the vertical and which laterally penetrates a minimum of one hundred and fifty (150) feet into the pay zone of the formation. For wells producing after July 1, 1994, and prior to July 1, 2002, the rebate shall be 24 months or ending upon payback. For wells producing after July 1, 2002, and prior to July 1, 2009, the rebate shall be 48 months or ending upon payback. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf

Unitization

Unitization

"A term frequently used interchangeably with pooling but more properly used to denominate the joint operation of all or some portion of a producing reservoir as distinguished from pooling, which term is used to describe the bringing together of small tracts sufficient for the granting of a well permit under applicable spacing rules." (Williams, Meyers, Martin, & Kramer, 2006)

In general, unitization is associated with enhanced or secondary recovery after wells have produced under primary operations for a length of time and are no longer producing at a commercial rate. “Unitization” is effected by joint operation of all or some portion of a producing reservoir to operate it as a separate unit. The purposes of unitization are to prevent the drilling of unnecessary wells and to increase recovery.

Unitization alters the amount of production revenues that each of the mineral interest owners receive. This allows each owner to share in the total production from all wells in the field based upon an allocation formula that represents an owner’s proportionate share of the production. (Interstate Oil and Gas Compact Commission, 2002)

The unitization process benefits all parties involved by reducing and eliminating potential waste of natural resources, increasing mineral interest revenues, and increasing state severance tax revenues.

In 1999, the IOGCC published a model statute for unitization. *The IOGCC Model Statute and Fieldwide Unitization References* recommended state statutes for unitizations in light of technological developments in horizontal drilling. The Unitization – Horizontal Drilling Subcommittee drew four basic conclusions about unitization:

- 1) Fieldwide unitization is the best legal method to promote increased development of oil and gas activities through technological advancements.
- 2) A flexible unitization statute promotes increased use of technological advancements, such as horizontal drilling.
- 3) A unitization statute should grant to the oil and gas conservation agency, broad authority to determine whether a particular technique for enhanced recovery will result in an increase in production.
- 4) A unitization statute should establish guidelines for the parties in the unit while providing the parties with flexibility to establish the unit. The unitization statute should, however, recognize many of the terms allowing for an effective unitization agreement.

Table 18. Unitization

Most states have implemented provisions for unitization, which allows for abrogation of usual well spacing rules and operation of a reservoir or part of a reservoir under the most efficient development

pattern. This increases the ultimate recovery of oil and gas and minimizes associated environmental effects. Some examples of provisions are provided below:

State	Alabama
Category	Tax incentive
Citation	Ala. Code § 40-20-2(e) (1975)
Title	<i>Levy and Amount of Tax upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Computes per well production of oil from unit operations for tax purposes based on aggregate production of oil from the entire unit divided by the number of wells within the unit, including injection, disposal and other wells utilized in unit operations.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
State	Alabama
Category	Tax incentive
Citation	Ala. Code § 9-17-85
Title	<i>Ratification</i>
Discussion	Reduces the percentage from 75% to 66 2/3% for ratification of a unit agreement under the terms of the allocation formula established by the State Oil and Gas Board and for ratification of an addition to the unit area.
URL	http://www.gsa.state.al.us/ogb/statutes.aspx
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 55-1304
Title	<i>Oil and Gas; Unitization</i>
Discussion	This act empowers the Kansas Corporation Commission (KCC) to unitize a pool upon request of a working interest owner under certain circumstances. First, the primary production from a pool has reached a low economic level and without introduction of artificial energy, abandonment of the well is imminent; or the unitized management sought is economically feasible and necessary to prevent waste. Second, the value of the estimated recovery is greater than the costs incident to conducting the recovery. Finally, the operation is fair and

	equitable. The act further establishes the rights of owners of oil and gas rights under unleased land as being a working interest to the extent of 7/8 interest and a royalty owner to the extent of 1/8 interest. The KCC can alter the extent of a royalty interest. Finally, the act states that it is the duty of the operator of the unit to file ad valorem taxes.
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 55-1305
Title	<i>Matters to Be Found by the Commission Precedent to Issuance of Unitization Orders; Hearings</i>
Discussion	See Kan. Stat. Ann. § 55-1304
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 55-1308
Title	<i>Commission Orders</i>
Discussion	See Kan. Stat. Ann. § 55-1304
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 55-1312
Title	<i>Rendition for Taxation of Property Used by Unit; Assessment and Taxation</i>
Discussion	See Kan. Stat. Ann. § 55-1304
URL	
State	Kansas
Category	Tax incentive

Citation	Kan. Stat. Ann. § 55-1316
Title	<i>Oil and Gas; Unitization; Definition of "Pool"; Legislative Intent</i>
Discussion	K.S.A. 55-1316 changed the definition of “pool” as it relates to the underground accumulation of oil and gas. This statute change expanded the definition of a “pool” to include “one or more natural reservoirs that are pressure connected.” This statutory change now allows for unitization in pools that have commingled production from more than one reservoir due to pressure communication within the wellbore. Additionally, K.S.A. 1317 provides that if at least 90% or more of the working interest owners approve, in writing, a contract for the unit operations of a pool or part of a pool, then the unit operations becomes effective without application to or order by the Kansas Corporation Commission. These statutes are part of Article 13 of Chapter 55 of the Kansas Statutes Annotated and amendments thereto. This is to allow the right of unitization of certain commingled pressure communicated reservoir(s) within a common wellbore. It also allows the establishment of voluntary unitization operations when at least 90% of the working interest owners ratify in writing, establishing such unit operations without KCC application or order of approval.
URL	
State	North Dakota
Category	Laws and Regulation
Citation	N.D. Cent. Code § 38-08-09.5
Title	<i>Ratification or Approval of Plan by Lessees and Owners</i>
Discussion	Statutory Unit Ratification. The statute lowers from 70% to 60% the percentage approval of working interests and mineral owners required to form an oil production unit. The NDIC and the NDPC are monitoring the effectiveness of this incentive.
URL	http://www.legis.nd.gov/cencode/t38c08.pd
State	South Dakota
Category	Laws and Regulation
Citation	S.D. Admin. R. 74:10:18
Title	<i>Risk Compensation in Compulsory Pooling and Unitization Orders</i>
Discussion	New rules were approved by the board, reviewed, and approved by the Legislative Research Council, and took effect July 1, 2004.
URL	http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:10:18

State	South Dakota
Category	Tax incentive
Citation	S.D. Admin. R. 74:10:18
Title	<i>Risk Compensation in Compulsory Pooling and Unitization Orders</i>
Discussion	Risk Compensation. The rule specifies risk compensation allowed in cases of forced pooling and compulsory unitization. It also allows cost plus 200% in compulsory pooling where interest is derived from a lease or other contract and allows cost plus 100% where interest is not subject to a lease or other contract. It allows cost plus 200% in compulsory unitization where interest is derived from a lease or other contract and allows cost plus 100% where interest is not subject to a lease or other contract. This incentive is to be granted by the South Dakota Department of Environment and Natural Resources Oil and Gas Section.
URL	http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:10:18
State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws § 45-9-40
Title	<i>Order of Board for Unit Operation of a Pool--Not Effective Until Approved by Persons Responsible for Operating Costs</i>
Discussion	Unit Ratification. This change lowered from 75% to 60% the percentage of working interest and mineral interest owners needed to ratify unit operations in cases of compulsory unitization. This incentive is to be granted by the South Dakota Department of Environment and Natural Resources Oil and Gas Section.
URL	http://legis.state.sd.us/sessions/2004/bills/HB1014enr.pdf

Noise Reduction

Exploration and production of oil and gas is often noisy. Not every state oil and gas authority has specific rules regarding noise from exploration and production activity. Many states handle noise abatement informally by encouraging use of sound barriers, specialized mufflers and other techniques. Often, other state and city ordinances apply to oil and gas sites.

In Colorado, Rule 802 applies to noise and gas abatement for oil and gas operations at well sites, production facilities and gas facilities. The rule imposes maximum noise levels by zone, provides for on-site investigations and measurements when a complaint is filed, directs that exhaust from mechanized equipment be vented away from occupied buildings.

Oklahoma recently passed legislation that limits noise on drilling and production sites and allows field inspectors to require companies to use mufflers on any equipment that creates sound higher than 65 decibels when measured at a distance of 300 feet from the boundary of the operation site.

Michigan's rule against "nuisance noise," rule 324.1015, includes a mechanism for requiring operators to track decibel levels in response to citizen complaints. Based on the findings, oil and gas authorities work with the operator to determine the best noise abatement plan and see that operators implement it satisfactorily.

Drilling, Completion, and Production Safety Practices

Drilling and completion of oil and gas wells and production from oil and gas wells is inherently risky. Generally speaking, drilling, completion, and production are intense industrial activities that require a high degree of skill and training and situational awareness. Industry, the states, and the Federal Government through the Department of Labor's Occupational Safety and Health Administration routinely look at practices and processes to determine ways to improve safety. Increasing safety improves production by preventing work slowdowns and stoppages, improves worker morale and health, and raises environmental awareness through constant review of drilling, completion and production practices.

Texas Provides Safety Procedures Education

The Texas Railroad Commission educates both operators and the public about oil and natural gas production in the state, as

well as safety and operating procedures. Among these educational tools:

Texas Petrofacts --- a monthly data review from the Railroad Commission.

Pipeline Safety Information --- information concerning pipeline permits, registrations, and facilities.

Production --- information concerning the production of oil and gas, natural gas, and mining.

Data and Statistics.

Drilling --- information concerning drilling and plugging activities, blowouts, and drilling permits.

Field Data --- information concerning listings of H₂S fields and other field information.

Online Research (Queries) --- information that allows users to research production, drilling permits, well records, and other related queries.

Operators --- information concerning active operators, top operators, and operator contact information.

Open Records --- information for obtaining open record requests.

Alaska offers comprehensive safety standards through the Alaska Department of Labor and Workforce Development Office of Occupational Safety and Health Standards. The office provides a guidance document, *Petroleum Drilling and Production Standards*, which was last revised in May 2001. The standards were adopted under 8 AAC 61.1180 and identify safety requirements for exploration and production operations.

In a January 12, 2009, press release, Louisiana Commissioner of Conservation James H. Welsh issued two permanent rules and a new policy that combine to give Louisiana some of the most stringent oil and gas drilling safety rules in the country.

The new rules, effective Dec. 20, 2008, track the federal government's requirements on the drilling it regulates, and, as of January 12, a new office policy bans wells within 1,000 feet of the crossing of Interstate highways over major waterways.

The 1,000-foot ban includes such areas as the I-10 crossing of the Sabine River, Calcasieu River, Atchafalaya Basin, Mississippi River, Lake Pontchartrain and Pearl River; the I-12 crossing of the Amite River; and the I-20 crossing of the Red, Ouachita, Tensas and Mississippi rivers, among others. Most oil and gas producing states have no rules addressing distance between oil and gas drilling operations and roadways, and the few that do require no more than a 100-foot distance.

One of the rules places many new requirements on well operators to ensure the proper design, testing, and use of blowout preventers and diverters, as well as new requirements for the quick operation of valves controlling in-pipe gas and fluid flow. The rule also requires operators to ensure that employees of contracted drilling companies receive recurring training on well control practices and to establish procedures to ensure employees retain the knowledge, skill, and competency to perform their well control duties.

These safety rules were developed after extensive study by the Louisiana Department of Natural Resources' Office of Conservation and the Commissioner's Ad Hoc Committee on Drilling Safety. The committee included representatives from the state, the oil and gas industry, and landowner interests.

Texas does not have a stand-alone document covering Safety Practice Rules, but rather relies on individual statewide rules (SWR). An example is SWR 36, which covers "Oil, Gas, or Geothermal Resource Operation in Hydrogen Sulfide Areas".

In Wyoming, safety practices are handled under Wyoming OSHA and the Governor's Committee on Work Place Safety. The rules address workmanlike operations that provide the supervisor regulatory compliance flexibility to address unsafe operations and activities in the drilling, completion, and production of operating oil and gas wells. Commission rules do address specific requirements for the protection of public safety.

In Alberta, Canada, jurisdiction over worker safety belongs to Alberta Occupational Health and Safety while jurisdiction over public safety remains with the Energy Resources Conservation Board (ERCB). Canada's legislation over worker safety in the oil and gas industry is applied either federally or provincially. The federal legislation applies to employees of companies or sectors that operate across provincial or international borders. Some business operations include exploration and development of petroleum on lands subject to federal jurisdiction and having pipelines that cross provincial and international borders.

The role of the ERCB is to ensure that the oil and gas industry understands and follows the requirement of the approvals and regulations such that Albertans are confident operations are being conducted in a responsible manner that protects the public, the environment, and the resources.

ERCB and Alberta Occupational Health and Safety have a joint working agreement to exchange information relevant to each other's jurisdiction; to notify each other about oil and gas industry incidents; to conduct joint inspections; and to cooperate during investigations involving each other's jurisdiction. A copy of the agreement is attached. The ERCB promotes staff worker safety through the implementation of an internal occupational health and safety management system. A copy of the ERCB Safety Manual is attached. Please refer to Section 3 for procedures specific to conducting oil and gas inspections.

Canada's six major petroleum industry trade associations are represented on Enform's Board of Directors. Enform is a petroleum safety association for Canada providing the essential training, certification, and safety services needed by the petroleum industry.

Enform develops and promotes safety products and practices that help the industry improve its safety record, and manage the safety certification of companies, employees, and contractors. Enform offers several publications on a variety of safety and health issues in the petroleum industry. These publications include A Guiding Principles for Worker Safety document, Guides to Safe Work, Safety Alerts, and Industry Recommended Practices (IRP). The practices set out in IRPs form the basis for minimum standards for the industry. For example, IRP 1 discusses the minimum standards for critical sour drilling. It is important to note that IRPs are not regulations. When there is an inconsistency or conflict with any applicable legislative requirement, the legislative requirement prevails.

Human Resources – A Critical Piece of the Energy Puzzle

Energy production is a complex process requiring a wide range of professionals in the scientific, technical, and business arenas. The IOGCC has been documenting the decreasing number of geologists, engineers and geophysicists since 2001. Declines are attributed to a number of factors -- all driven by price volatility in the energy industry – that influence job stability, infrastructure investments, and research and development. Cumulatively, this has impacted the industry in two key areas: a large percentage of employees approaching retirement and a slowdown in undergraduate and graduate enrollments in the geosciences and petroleum engineering disciplines.

Initially, technological improvements - by increasing efficiency and effectiveness of drilling activities – reduced technical manpower requirements and allowed companies to do more work with fewer people. However, the rate of change is slowing, and current trends indicate that future improvements will not be enough to offset the impending loss of senior expertise (Interstate Oil and Gas Compact Commission, 2004).

From a regulatory perspective, technology improvements, a slow economy, and the ensuing manpower shortage have the potential to impact state regulatory agencies. Many times, state regulatory agencies are subject to blanket budget shortfalls even though oil and gas tax revenues contribute significantly to state budgets. This restricts the ability of states to offer salaries competitive with industry. State agencies can and do hire new recruits and invest significantly in training activities.

Opportunity Abounds – Educating the Nation’s Future Workers

Collaborative efforts are being made by state regulatory agencies, state employment agencies and workforce development entities, academia, vocational institutions, and industry to address manpower shortages. Many states have instituted educational programs that specifically address the energy industry.

Associate's Degrees and Vocational Training

Across the nation, vocational schools and community colleges have developed educational programs targeting the energy industry and oil and gas. These schools collaborate with state workforce and unemployment agencies, local industry associations and operators, and state regulators to develop programs that meet the needs of their communities.

The Mid-Continent Oil and Gas Training Center, operating through the High Plains Technology Center in Woodward, Oklahoma, combines simulation, classroom time, and hands-on training for front-line workers in the oil and gas industry. Since 2005, the Center has trained more than 4,200 potential workers.

San Juan College's School of Energy in Farmington, New Mexico, has developed Associates of Applied Science degrees and certificate programs in Natural Gas Compression, Industrial Process Operators, Lease Operators, Renewable Energy, Well Control, Safety, CDL (Commercial Drivers License) and Rig Operations.

Pierpoint Community and Technical College operates the Appalachian Basin Oil and Gas Training Center in Fairmont, West Virginia. Participants can enroll in the Floorhand Training Program -- a five-day, 40-hour intensive hands-on curricula -- either independently or be sponsored by their company.

In Pennsylvania, oil and gas industry associations have partnered with workforce investment boards, economic development agencies, and academia to develop job training and employment programs. The Pennsylvania Oil & Gas Industry Workforce Partnership has helped launch the Energy Institute at the University of Pittsburgh at Bradford, which offers an associate's degree in petroleum technology and petroleum land agent training. The agency has launched an employee recruitment campaign through television advertising, job fairs, and communication with career counselors and employment agencies.

Additional Resources

Case Study: Colorado's Technical Responses to Rulemaking

A case study examining how the state of Colorado responded technically to their recent rulemaking is provided as an appendix to this report

Case Study: Risk-Based Data Management System

A case study examining the development and implementation of the Ground Water Protection Council's Risk-Based Data Management System is provided as an appendix to this report.

IOGCC Model Statute and Fieldwide Unitization References (2002)

Developed by the Unitization - Horizontal Drilling Subcommittee of the Energy Resources, Research and Technical Committee, this model statute was written in response to emergent and new technological developments in horizontal drilling.

Petroleum Professionals – Blue Ribbon Task Forces: A Follow-Up Report (2007)

Several years ago, it became apparent to many industry, professional, and government leaders that there was a shortage in the number of geoscientists and other trained professionals needed to support the domestic production of oil and natural gas.

The report, written by IOGCC 2007 Chairman Gov. John Hoeven of North Dakota, provides current information about the status of a manpower shortage facing the domestic petroleum industry. In addition, the report evaluates the efforts of state governments, the federal government, and industry to solve the problem.

The Petroleum Pros (2004)

Governor Hoeven's Blue Ribbon Task Force prepared its report and recommendations in the summer of 2004. Robert Harms, former counsel to Governor Hoeven, testified before the U.S. House Subcommittee on Energy and Minerals Resources based upon the results. The report documents the falling number of petroleum-specific degrees being awarded by U.S. colleges and universities.

Oil and Gas Policy: Evaluation for Energy Security (2007)

This policy document analyzes the nation's energy situation, with potential solutions to identified problems. Analysis took place over the summer of 2006 through a series of conferences sponsored by Congressional Quarterly in which the IOGCC participated.

IOGCC Resolution 06.052 called for the creation of a policy document that would "avoid choices that will exacerbate our nation's energy situation by discouraging domestic production."

This concise, easy-to-read publication provides an overview of the energy environment from the early 1970s through 2007.

A team of experts identified by the IOGCC Steering Committee made five recommendations for improving national and state policies:

- 1) Improve dialogue with the American public about energy policy and its consequences to them.
- 2) Promote the expansion of research to recover domestic oil and gas resources.
- 3) Re-examine federal and state policies as they relate to oil and natural gas development in consideration of new incentives for exploration and production.
- 4) Encourage conservation of fossil fuel resources by the public and efficient production technologies.
- 5) Address manpower issues.

A Guide to Practical Management of Produced Water (2006)

Thinking of produced water as another resource rather than a waste has real advantages. Treated and untreated produced water might be able to satisfy a great deal of the water needs of ranchers, power plants, and coal mines across the West.

Funded by the DOE and prepared by the IOGCC and ALL Consulting, this research report focuses on the management of produced water from conventional and unconventional onshore exploration and production operations in the United States. Produced water has been identified as a source of agricultural irrigation, power generation, EOR, surface discharge, and even water for wildlife.

Adverse Impact Reduction Handbook (2008)

Funded by the DOE and prepared by the IOGCC and ALL Consulting, this handbook summarizes solutions to issues that pose the most significant impedances or delays to onshore exploration and production activities. The handbook outlines approaches to avoid, minimize, and /or mitigate environmental impacts. The handbook is useful for regulatory personnel and the regulated exploration and production community

Stepping Lightly: Reducing the Environmental Footprint of Oil and Gas Production (2008)

This publication is designed to share the results of the Adverse Impact Reduction Handbook and to promote the IOGCC's continuing efforts to encourage collaboration among government agencies, energy producers, non-government organizations and private citizens to protect our natural world while meeting the nation's energy needs.

Chapter 3. Unconventional Natural Gas

Unconventional Natural Gas

Gas from unconventional sources—in 'tight' (low-permeability) formations, or in formations with challenging production economics (Gas Technology Inc.).

The term “unconventional natural gas” refers to gas that is not extracted and produced from typical formations. The potential for unconventional production has increased tremendously in the last decade and can generally be divided into three categories: shale gas, coal-bed methane (CBM), and tight sands.

Unconventional resources represent the bridge to a cleaner energy future. Much of the domestic resource is tied up in unconventional resources, representing a great opportunity for investment and increasing energy independence. Current projections have the U.S. containing 1,214.58 Tcf of unconventional gas. More than 309 Tcf of natural gas is contained in tight sand formation; 742 Tcf of natural gas is contained in shale formations; 163 Tcf is contained in coal-bed methane seams. The potential for unconventional gas is seen not only in the amounts of unconventional gas in place but also in trends in industry. (UnconventionalFigures). Incentives and improvements in technology help spur unconventional natural gas projects, promoting a secure energy future for the United States and generating jobs and revenue for the states.

Shale Gas

Advances in technology are unlocking the potential of shale gas in the United States. Horizontal drilling is leading to production in shale formations once thought to be inaccessible.

Member states of the IOGCC understand the importance of shale gas for domestic production and continue to be good stewards of this new resource.

The IOGCC Shale Gas Directors Task Force -- comprised of the regulating officials in 17 shale gas producing states -- was formed and held its first meeting in February 2009. Directors identified challenges and opportunities facing shale gas states and discussed possible projects for development.

Directors share appropriate operating procedures, discuss current and future projects for development, and continue working on planned activities. The Task Force determined that the most

effective approach to stimulate basin development would be a “clearinghouse” of regulatory information for Shale Gas states.

The Task Force is developing the shale gas page for Groundwork, IOGCC’s regulatory Website. Content includes regulatory fact sheets on the topics of water management and water disposal, infrastructure, and hydraulic fracturing.

An integral component of shale gas development is the process of hydraulic fracturing. Recognizing the importance of helping U.S. citizens, policy-makers, and lawmakers to understand the importance of shale gas to our economy and energy security, as well as the safeguards in place to prevent damage from shale gas exploration and production, the Task Force provides input and guidance into the development of material for the Groundwork hydraulic fracturing site.

In October 2009, IOGCC member states passed Resolution 09.106 that resolves that shale gas should be encouraged under conditions that protect the environment and public health and safety. Key highlights of [Resolution 09.106](#):

Domestic sources of natural gas are expected to increase as a share of U.S. supply from 84 percent in 2007 to 97 percent in 2030.

Member states of the IOGCC have proven to have effective regulatory systems that protect water, air, soils, and other resources as well as public health and safety.

It is crucial for U.S. citizens, policy-makers, and lawmakers to understand the importance of shale gas to our economy and energy security as well as the safeguards in place to minimize impacts from shale gas exploration and production.

IOGCC member states re-authorized Resolution 09.104 --- originally approved in September 2007 --- in October 2009. The resolution urges state regulators to develop strategies to encourage the expansion of a natural gas infrastructure. The National Association of Regulatory Commissioners (NARUC) has adopted a similar policy statement. Key highlights of [Resolution 09.104](#):

The United States must continue to expand its natural gas infrastructure to accommodate gas supplies from new sources, to meet growing demand, and to provide storage accommodating higher peak demands.

State regulators are urged to recognize the need for long-term transportation and storage contracts that attract long-term preferred financing of additional gas transportation and storage infrastructure to accommodate future gas demand while moderating natural gas prices.

Table 19. Shale Gas Rules and Regulations

State	Alabama
Category	Laws and Regulation
Citation	Ala. Code §§ 9-17-1, 9-17-6, 9-17-12
Title	<i>Drainage or Production Units</i>
Discussion	Allows more than one well to be drilled and produced within the drainage or production units in shale gas fields.
URL	http://www.gsa.state.al.us/ogb/statutes.aspx#http://www.gsa.state.al.us/ogb/statutes.aspx
State	Oklahoma
Category	Laws and Regulation
Citation	Okla. Admin. Code § 165:10-17
Title	<i>Well Tests</i>
Discussion	Upon written request, the rulemaking provided for more time to perform the state test than the 30-day period specified in the rule. This change was implemented primarily to accommodate the longer time required to recover frac fluids and "fines" created in certain stimulation techniques used in the completion of Woodford Shale gas wells. Shutting in the well too early to perform the state test posed a higher risk of damaging the well or even losing it.
URL	
State	South Dakota
Category	Laws and Regulation
Citation	S.D. Admin. R. 74:10:03:16
Title	<i>Procedures for Setting Surface Casing and Production Casing</i>
Discussion	The rule currently requires a minimum of 100 feet of surface casing to protect shallow

	aquifers in all oil and gas wells. Operators that are exploring for shallow oil and gas in the state asked the department to change the current rule because some of the oil and gas they are targeting is at depths of less than 100 feet. In addition, there are areas in the state where 100 feet of surface casing is not necessary due to the surface geology (shale, glacial till). This rule change will allow the Secretary to waive the minimum 100 feet of surface casing requirement in such cases. The Board of Minerals and Environment held a hearing and approved the change to this rule on July 16, 2008, and the Legislative Interim Rules Committee held a hearing and approved the change to this rule on August 19, 2008.
URL	http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:10:03:16

Tight Sands

Tight sands gas is natural gas that is stuck in very tight, usually sandstone, formations underground. In a normal reservoir, the gas can be extracted easily and readily. Tight sands gas formations, on the other hand, require extensive stimulation, usually through acidizing or fracturing. Production from tight sands formations can be cost prohibitive so the economic incentive must be present to encourage producers and operators to develop these resources. The Energy Information Administration estimates that tight sands gas formations account for 309.58 Tcf of technically recoverable reserves, representing 17% of the total recoverable natural gas in the United States (EIA).

Table 20. Tight Sands Incentives

State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §26-58-111
Title	<i>Rates of Tax</i>
Discussion	Tight sands and unconventional sources receive a severance tax reduction from 5% to 1.5% for 36 to 48 months depending on well payout.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm#http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm

Coal-bed Methane (CBM)

CBM, sometimes referred to as “coal seam natural gas,” is methane found in coal seams and produced using unconventional methods. The removal of the methane-rich gas in present in coal-beds is

a necessary and sometimes dangerous part of the coal-mining process. In the past, this gas was vented, but advances in technology now make the capture and production of CBM a viable and economic possibility.

Table 21. State Incentives for CBM Production

State	Alabama
Category	Laws and Regulation
Citation	Ala. Code §§ 9-17-1, 9-17-6, 9-17-12
Title	<i>Drainage or Production Units</i>
Discussion	Allows a second well to be drilled and produced within 80-acre drainage or production units in coalbed methane fields.
URL	http://www.gsa.state.al.us/ogb/statutes.aspx#http://www.gsa.state.al.us/ogb/statutes.aspx
State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §26-58-111
Title	<i>Rates of Tax</i>
Discussion	Coalbed methane wells receive a reduction in severance tax from 5% to 1.5% for 36 to 48 months depending on payout.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm
State	Maryland
Category	Laws and Regulation
Citation	Environment Article 14 Section 112(a)(2)
Title	<i>Location of wells</i>
Discussion	This change allows for placement of coalbed methane wells at 500 feet from unleased property. The previous standard was 1,000 feet, and remains at that distance for all other wells.

URL	http://michie.lexisnexis.com/maryland/lpext.dll?f=templates&fn=main-h.htm&cp
State	Pennsylvania
Category	Tax incentive
Citation	58 Pa. Stat. Ann. § 507
Title	<i>Minimum Distance Between Gas Wells</i>
Discussion	HB 2804 amended this section to repeal the 330-foot setback requirement; 2004 Pa. Legis. Serv. Act 2004-171 from the lease line for gas wells to be drilled in areas underlain by deep mineable coal seams. This is to allow the development on smaller parcels while maintaining coordination with coal resources.
URL	http://www.dep.state.pa.us/dep/deputate/minres/oilgas/Act214uc.htm#Sec7
State	Virginia
Category	Tax incentive
Citation	Va. Code Ann. § 45.1-361.22
Title	<i>Pooling of Interest for Coalbed Methane Gas Wells; Conflicting Claims to Ownership</i>
Discussion	Escrow of Coalbed Methane Conflicting Ownership Claims. Established under section 45.1-361.22 of the Virginia Gas and Oil Act, the Virginia Gas and Oil Board may escrow proceeds from a coal seam natural gas production well in a unit where there are conflicting claims to ownership. The Board pays the escrowed proceeds when there is a final decision of a court of competent jurisdiction or agreement among conflicting claimants addressing the ownership of the gas. The Virginia Department of Mines, Minerals and Energy has determined that this section of the Virginia Code has been one key factor that has led to increases in coal seam natural gas production from nominal levels in 1989 to nearly 70 BCF/year.
URL	http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+45.1-361.22
State	Virginia
Category	Laws and Regulation
Citation	Va. Code Ann. § 45.1-361.29.F.2 (amended by 1996 Va. Acts 759 and 765)

Title	<i>Consent to Stimulate Coalbed Methane</i>
Discussion	The Virginia Gas and Oil Act requires a producer of coal seam natural gas to obtain consent from the operator of each coal seam located within 750 horizontal feet of a well or 100 vertical feet of any coal seam to be stimulated. A 1997 amendment to this requirement provides that this consent shall be deemed to be granted for any tract where title to the coal is held by multiple owners who have not leased the tract for coal development when the gas operator obtains consent from the co-owners holding a majority interest in the tract. The goal of this act is to allow production of coal seam natural gas when the consent to stimulate cannot be obtained from all co-owners of a tract of coal.
URL	http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+45.1-361.29
State	Virginia
Category	Tax incentive
Citation	Va. Code Ann. § 58.1 - 439.2
Title	<i>Coalfield Employment Enhancement Tax Credit</i>
Discussion	One cent per million BTUs of coal seam natural gas production is credited to the producer.
URL	# http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+58.1-439.2#
State	West Virginia
Category	Laws and Regulation
Citation	GP-WV-1-07
Title	<i>General Water Pollution Control Permit, Permit Number: GP-WV-1-07</i>
Discussion	This General Permit establishes a simple, efficient and economical method for the disposal and regulation of water produced from coalbed methane production that is fully protective of the environment. The Permit strengthens the concept of environmental impact prevention by including provisions for background sampling and sampling in control areas to establish a baseline for evaluating the impact of land applied water on the environment. The Permit incorporates new parameters to the regular sampling process, which will provide information used for soil and groundwater protection and considers more exhaustive monitoring methods for groundwater.
URL	
State	West Virginia

Category	Tax incentive
Citation	WV Code Chapter 11, Article 13A-3d
Title	<i>Imposition of tax or privilege of severing coal, limestone or sandstone, or furnishing certain health care services, effective dates for reduction of severance rate for coal mined by underground methods based on seam thickness -- Tax in addition to other taxes</i>
Discussion	Severance Tax exemption/reduction for coalbed methane. Effective January 1, 2009; this exemption is designed to encourage capture of methane gas that would otherwise be vented to the atmosphere.
URL	http://www.legis.state.wv.us/WVCODE/Code.cfm?chap=11&art=13A#13A

Fracturing Misconceptions: A Long History of Effective State Regulation, Groundwater Protection, and the Ill-Conceived FRAC Act

Hydraulic fracturing is a safe, environmentally sound oil and gas recovery method. It is also essential to meeting America's growing demand for natural gas. Each year, there are approximately 35,000 wells completed using hydraulic fracturing, with nearly one million wells to date completed using hydraulic fracturing (*Obama Administration*, 2009). Hydraulic fracturing has allowed for the production of more than 600 trillion cubic feet of natural gas and 7 billion barrels of oil (Independent Petroleum Association of America [IPAA], 2008).

The hydraulic fracturing process is effectively regulated by states but there are efforts being made in the U.S. Congress to bring its regulation under the purview of the Safe Drinking Water Act (FRAC Act, 2009). By attempting to regulate hydraulic fracturing under this Act, the federal government will only serve to impose costly regulatory hurdles that will inhibit the development of the United States' vast reserves of natural gas trapped in shale formations throughout the country. This proposed regulation is a one-size fits all approach, unnecessarily transferring to the federal government the regulation of an industry that has been effectively regulated by states. Each state has a vested interest in the protection of their natural environments. To that end, they have been effectively regulating the oil and gas industry since the early 20th century. The additional hurdle proposed before Congress is unnecessary and lacks an understanding of the technology and regulation concerning the development of the nation's indigenous hydrocarbon resources. Further, in a hearing before the Senate Committee on

Environmental and Public Works, representatives from the EPA testified that they had not heard of one case of ground water contamination due to hydraulic fracturing (*Obama Administration, 2009*).

Imposing unnecessary federal regulations on a process that has a 50 year history of effective state regulation would cause much of the domestic energy supply to remain unproduced, further increasing U.S. dependence on foreign sources of oil.

What is hydraulic fracturing?

In tight shale formations, the recovery of oil and natural gas is done through the use of channels or cracks that exist in the formation. Hydraulic fracturing improves the productivity of a well either by creating new fractures or channels for hydrocarbons to pass through or through expansion of existing fractures or channels (Van Dyke, 1997). Hydraulic fracturing utilizes the high pressure injection of water, sand, and proppants to create or enhance the permeability of subsurface rock in a rock formation that contains hydrocarbons (Department of Energy [DOE], 2009). Fracturing involves the targeting of formations and determining the desired length of the fracture so as not to intrude on other formations or extend the fracture unnecessarily (DOE, 2009). Understanding the rock strata to be fractured is critical to the success of the fracturing operation (DOE, 2009). The fracturing fluids are pumped into the target formation at calculated pressures to generate cracks (DOE, 2009). As the pressure builds from the injection, it permits the cracking of rock formations housing oil and natural gas (Van Dyke, 1997).

Drilling for oil and gas is a risky business. Drilling and production operations are incredibly expensive and capital intensive. Technology and education in the oil field have been geared toward minimizing the risks associated with oil and gas drilling. Hydraulic fracturing is similarly risky. It is incredibly expensive to fracture an oil and gas well. If the fracture operations occur in the wrong part of the formation or in the wrong formation entirely, the well could turn up dry, meaning that there are no hydrocarbons to produce. Further, if the fracture in the pay zone extends too far, there is a serious risk that water could migrate into the wellbore. When water migrates into the wellbore, it is considered “watered out” and is no longer capable of producing hydrocarbons. With the risks of drilling only augmented in hydraulic fracturing operations, operators are heavily incentivized not to do anything that will inhibit recouping the costs sunk in the wellbore. Not only do operators not want to harm ground water for safety purposes, they also do not want to harm ground water because it can kill the well.

Hydraulic Fracturing: A Game-Changer in Shale Resource Plays

Whereas oil can be recovered from shale formations, the real progress in shale development has been in natural gas shale development. There are many natural gas shale basins spread throughout the United States (DOE, 2009). Advances in drilling technology, hydraulic fracturing, and high prices for natural gas and oil have encouraged the development of these shale “plays” across the United States.

In order to understand the importance of hydraulic fracturing, it is necessary to quantify the amount of gas that can be recovered using the process. In 2008, hydraulic fracturing allowed for the estimated recovery of 25 billion cubic feet of natural gas per day from unconventional gas resources (DOE, 2009). Unconventional gas resources are those gas resources contained in tight gas formations, shale gas, gas hydrates and coalbed methane. By 2018, the amount of recoverable gas in the U.S. is expected to be in the neighborhood of 40 billion cubic feet per day, much of that production coming from shale gas (DOE, 2009). In 2008, the United States consumed 23 trillion cubic feet of gas (Energy Information Administration [EIA], 2009). This consumption was primarily based on the activity of the three largest consuming sectors of the U.S. economy – lease and plant fuel, pipeline and distribution use, and delivery to end use consumers (comprised of residential, commercial, industrial, vehicle fuel, and electric power) (EIA, 2009). The consumption figures do not break down which type of gas (shale, tight gas, coal-bed methane, or conventional) was used by which sector. Of the 23 trillion cubic feet of natural gas consumed, roughly 40% of natural gas consumption was provided for by production from unconventional gas sources.

It should be noted that these figures are not linear, meaning that not everything that is produced in the U.S. is consumed in the U.S., and not everything that is consumed in the U.S. is produced in the U.S. In 2008, the U.S. imported 3.98 trillion cubic feet of gas and exported 1 trillion cubic feet of gas (EIA, 2009). These import and export numbers are small in comparison to what is produced and consumed. The amount of natural gas imported is especially small when compared to imported crude oil. In 2008, the U.S. imported 4.72 billion barrels of crude oil (EIA, 2009). For the same year, the U.S. produced 1.8 billion barrels of crude oil and consumed more than 7 billion barrels of oil (EIA, 2009). The disparity between what is produced and consumed in terms of crude oil does not need to be discussed *ad nauseum*. What is interesting is the fact that the U.S. is resting on enough natural gas to meet demand for approximately 87 to 116 years (DOE, 2009). Natural gas production really is a domestic treasure that should be utilized in order to keep the economy going, houses warm, and our nation secure.

As hydraulic fracturing processes improve and shale gas plays become more and more economic to develop, shale gas contributions to production and consumption will only increase. Therefore, the importance of hydraulic fracturing will only increase. Hydraulic fracturing is a key ingredient to a more secure and viable energy future for the U.S. For that reason it is a game changer that should be encouraged to develop.

The Environmental Debate

Hydraulic fracturing has recently come under attack because of reports of hydraulic fracturing fluid contaminating ground water sources. As with any industrial activity, there is the risk of environmental degradation. However, the oil and gas industry is keenly aware of the risks associated with production operations. With public scrutiny focused on the industry, it is increasingly aware and making efforts to minimize its environmental footprint.

On June 9, 2009 legislation was proposed in both the U.S. House of Representatives and the U.S. Senate to require regulation of hydraulic fracturing under the Safe Drinking Water Act. The Fracturing Responsibility and Awareness of Chemicals (FRAC) Act was introduced in the House by Colorado Representative Diana DeGette (House FRAC Act, 2009). A Senate version of the bill was introduced on the same day (Senate FRAC Act, 2009). DeGette has stated that the purpose of the bill is to close the affectionately titled “Halliburton loophole” in the Safe Drinking Water Act by requiring companies conducting fracturing operations to disclose the chemicals used in their fracturing operations (Williams, 2009). The “loophole” DeGette is trying to close was created by an amendment to the Safe Drinking Water Act that was passed with the Energy Policy Act of 2005 (Energy Policy Act, 2005). The Energy Policy Act amended the Safe Drinking Water Act by changing section 300h(d) to read as follows:

The term “underground injection”--

(A) means the subsurface emplacement of fluids by well injection; and

(B) excludes--

(i) the underground injection of natural gas for purposes of storage; and

(ii) the underground injection of fluids or propping agents (other than diesel fuels) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities (Energy Policy Act, 2005).

The environmental debate was further invigorated by a fracturing chemical spill by Cabot Oil and Gas Corporation in Pennsylvania. On September 16, 2009, two chemical spills took place in the town of Dimock, Pennsylvania, where Cabot was conducting drilling operations in the Marcellus shale (Penn. Charges Cabot, 2009). The spills occurred because of failed pipe connections, which were reported to the Pennsylvania Department of Environmental Protection (Penn. Charges Cabot, 2009). Altogether, close to 8000 gallons of the fracturing fluid containing the chemical LGC-35 CBM were spilled into a nearby creek (Penn. Charges Cabot, 2009). The chemical is a potentially carcinogenic lubricant, but the concentrations of the chemical in the fracturing fluid were found to be so diluted that they were harmless and the Pennsylvania Department of Environmental Protection found that there was no evidence of groundwater contamination from the spills (Penn. Charges Cabot, 2009). As a result of the spills, Cabot Oil and Gas was fined \$56,650 and ordered not to conduct any fracturing operations until the spill was cleaned up (Penn. Fines Cabot, 2009). The ban imposed on Cabot was lifted on October 16, 2009 and Cabot has since resumed their fracturing operations (Penn. Fines Cabot, 2009). While some residents view the fine as a “joke,” the Pennsylvania Department of Environmental Protection thinks the fine and subsequent ban were enough to teach Cabot a lesson (Penn. Fines Cabot, 2009). The state was quick to respond to the spill, conducting tests on water wells. Those tests, as mentioned above, failed to show any contamination in the wells from the fracturing fluid spills.

Oil and gas operators drill with the utmost care and concern for the environment. With an eye toward responsible production of oil and natural gas, many operators have fracturing-appropriate operating procedures. Operators conducting fracturing operations do not go into a shale play blindly. Fracturing operations are designed based upon past experience and data with the formation that is being fractured (Arthur et al, 2008). Vast amounts of data are collected and analyzed in order to ensure optimal fracturing success. Further, a lot of time and money are expended in designing the fracture. Modeling programs allow geologists and engineers to modify and evaluate the design of the fracture treatment and to determine the desired height, length, and orientation of the potential fracture prior to operations beginning (Arthur et al., 2008). The purpose of this time consuming process is to ensure that the fractures do not extend beyond the optimal zone of production and to ensure that the fractures do not grow out of the formation. If the fractures were to extend beyond the fractured formation, production from the fracture would be greatly reduced, essentially forcing all the time and money spent

on the development of the shale play into a dry hole. Before operations commence, operators also perform a series of tests to ensure that the well, well equipment and hydraulic fracturing equipment are in good working order and will hold up to the pressures of the fracturing treatment (Arthur et al., 2008). Once the fractures are designed and thorough testing of the wellbore has been completed, the fracturing treatment begins with the pumping of an acid treatment into the wellbore, to clean out the wellbore and increase permeability which is lost in the drilling process (Arthur et al., 2008). After the acid treatment, the slick water pad is added to the wellbore (Arthur et al., 2008). **The “slickwater pad” is a mixture of water and a lubricant designed to facilitate the movement of proppants through the wellbore (Arthur et al., 2008).** After the slickwater pad is added, the first proppant sequence begins, with each subsequent proppant stage implementing an increasingly coarser proppant particle (Arthur et al., 2008). The proppant sequence aids in the fracturing by keeping the fractures open to allow for the recovery of oil, natural gas, and fracturing fluid (Propping Agent).

[LEAF takes on the EPA and the Safe Drinking Water Act](#)

The Safe Drinking Water Act was passed by Congress in 1974 to protect the public health through the regulation of the nation’s drinking water supplies (Safe Drinking Water Act Basic Information, 2009). The Safe Drinking Water Act requires the EPA to develop regulations for the underground injection of fluids in order to protect underground sources of drinking water (USDWs) (Federal UIC Regulations, 2009). To implement the underground injection control program (UIC), the states are granted the authority to develop their own UIC programs in compliance with standards set by the Safe Drinking Water Act (Federal UIC Regulations, 2009). The specific requirements of the UIC programs are set out in 40 C.F.R. 144.1 (UIC Requirements, 2009).

Prior to 1997, the Environmental Protection Agency operated under the understanding that hydraulic fracturing operations do not fall under the umbrella of underground injection control regulations (LEAF I, 1997). The EPA viewed “underground injection” as injection where the primary purpose is the emplacement of fluids below the ground-surface, not for use in oil and gas recovery operations (LEAF I, 1997). In *LEAF v. EPA*, the Court of Appeals for the 11th Circuit addressed the issue of whether the Environmental Protection Agency is legally required to regulate hydraulic fracturing under the underground injection control programs established pursuant to Part C of the Safe Drinking Water Act (LEAF I, 1997). The EPA argued that hydraulic fracturing did not fall under the jurisdiction of the Safe Drinking Water Act because (1) the phrase “underground injection” was ambiguous; (2) Congress

intended to exclude those wells whose primary purpose was not the emplacement of fluids underground; and (3) the EPA's interpretation of the statute was a permissible interpretation (LEAF I, 1997). LEAF (Legal Environmental Assistance Foundation) argued that the EPA's interpretation of the statute must fail because it would render the UIC regulations inconsistent with the statute (LEAF I, 1997). The source of the controversy was the use of hydraulic fracturing in Alabama for the recovery of coalbed methane. Since 1980, several thousand coalbed methane wells have been drilled in Alabama (LEAF I, 1997). The court concluded that hydraulic fracturing operations do constitute "underground injection" for the purposes of the Safe Drinking Water Act, and that the EPA's interpretation of what could not be "squared with the plain language of the statute and thus must fail," and that while the courts will give the EPA broad discretion in making policy, the agency must bow to the will of Congress when it interprets legislation (LEAF I, 1997).

Upon remand to the agency, the EPA began proceedings to repeal Alabama's UIC program for coalbed methane production (LEAF II, 2001). Prior to the conclusion of the EPA proceedings, Alabama presented the EPA with a revised UIC program which the EPA subsequently approved (LEAF II, 2001). LEAF petitioned the 11th circuit for review again but the court denied remand, upholding the EPA's approval of Alabama's revised UIC program under section 1425 of the Safe Drinking Water Act (LEAF II, 2001).

Disclosure of Chemicals Used in Fracturing as called for in the DeGette FRAC Act

The bread and butter issue surrounding the chemicals used in hydraulic fracturing is whether or not the chemicals contaminate water supplies. Historically, oil and gas operators have been protected from the disclosure of the chemicals used in hydraulic fracturing due to trade secret concerns (Lustgarten, 2009). Many of the chemicals used in fracturing are considered proprietary information and should be protected (Lustgarten, 2009).

The FRAC Act seeks to amend section 300h(b)(C) of the Safe Drinking Water Act by adding the following language to the section:

including a requirement that any person using hydraulic fracturing disclose to the State (or the Administrator if the Administrator has primary enforcement responsibility in the state) the chemical constituents (but not the proprietary chemical formulas) used in the fracturing process (FRAC Act, 2009).

The FRAC Act amends section 300h further by adding to 300h(b) subpart (4) to section to read:

(4) The State (or Administrator) shall make the disclosure or chemical constituents referred to in subparagraph (C) of paragraph (1) available to the public, including a posting of the information on an appropriate Internet website. *In addition, whenever the State or the Administrator, or a treating physician or nurse, determines that a medical emergency exists and the proprietary chemical formulas or specific chemical identity of a chemical used in hydraulic fracturing is necessary for emergency first-aid treatment, the person using hydraulic fracturing shall immediately disclose the proprietary chemical formulas or the specific chemical identity of a trade secret chemical to the State, the Administrator, or that treating physician or nurse, regardless of the existence of a written statement of need or a confidentiality agreement.* The person using hydraulic fracturing may require a written statement of need and a confidentiality agreement as soon thereafter as circumstances permit (FRAC Act, 2009).

The FRAC Act also adds inclusive language as to what constitutes underground injection. Where the Energy Policy Act of 2005 exempted the injection of fracturing fluids from the underground injection requirements of the Safe Drinking Water Act, the FRAC Act proposes to include hydraulic fracturing fluids, essentially making the holding in the first LEAF case federal law.

In anticipation of the FRAC Act, or perhaps to neutralize its effects, many oil and gas operators are already moving to disclose the chemicals they use in fracturing operations. In October 2009, Aubrey McClendon, president and CEO of Chesapeake Energy, and John Pinkerton, chairman and CEO of Range Resources, Inc. both called for the oil and gas industry to disclose the chemicals used in their respective hydraulic fracturing jobs (Howell, 2009). McClendon stated that the oil and gas industry needed to “demystify” hydraulic fracturing and to “disclose the chemicals [the industry is] using and search for alternatives to the chemicals [the industry is] using” (Howell, 2009). Pinkerton has also asked well operators to disclose the chemicals used in fracturing jobs that are conducted on behalf of Range Resources, stating that the confidentiality agreements that the operators impose are unacceptable (Howell, 2009). Schlumberger, an oil field services company, has also called for its suppliers to disclose the chemicals used in the fracturing solutions the company gets from its suppliers (Howell, 2009). Environmental groups, like the Natural Resources Defense Council, have welcomed this industry call for disclosure but qualifies that welcoming tone with the stern reminder that this disclosure is long overdue (Howell, 2009).

While disclosure of the chemicals appears innocuous on its face, there is cause for operators to approach disclosure with caution. If the FRAC Act simply called for the chemicals used in hydraulic fracturing, that would be the end of the discussion. Instead, the FRAC Act includes a provision that calls for the disclosure of the proprietary chemical formulas as well (FRAC Act, 2009). The FRAC Act does allow for the operator to request a confidentiality agreement when the formulas are disclosed, but the wording of the proposed change leaves much to interpretation (FRAC Act, 2009). The FRAC Act reads: “The person using hydraulic fracturing may require a written statement of need and a confidentiality agreement as soon thereafter as circumstances permit” (FRAC Act, 2009). This language would seem to assuage the fears of operators that their proprietary chemical formulas might become public, but there appears to be a disconnect in the timing of the disclosure of the chemical formulas and the time when an operator can submit a written request for the confidentiality agreement. Under the FRAC Act, when the State, Administrator or a medical official establishes that a medical emergency exists, the operators *shall* disclose the chemical formulas *immediately* (FRAC Act, 2009).

The language that a confidentiality agreement can be signed “as soon thereafter as circumstances permit” is cold comfort (FRAC Act, 2009). The FRAC Act effectively places the cards in the hands of the Administrator of the EPA, the State, or a medical official in determining the disclosure of the fracturing chemical formulations. The language of the Act implies that while the operator may require a statement of confidentiality, the timing of the confidentiality agreement and the signing of the confidentiality agreement are at the discretion of regulating officials or the persons asked to sign the confidentiality agreement. In a perfect world, this would not be much of a concern; everyone would cooperate and the process would be smooth and seamless. The ambiguity in the timing requirement for the confidentiality agreement leaves a gaping hole allowing for proprietary information to be leaked to outside sources. The axiom: “Two people can keep a secret if one of them is dead” rings true here. The operator could hand over the chemical formulas to the authorities in the event of a medical emergency, but what keeps the information safe between disclosure and the signing of the confidentiality agreement? While there might be an argument for an implied obligation to keep the information confidential, that argument would most likely prove fruitless given the medical emergency that called for disclosure of the formula and the public’s interest in knowing the effects of the chemicals that supposedly caused the medical emergency.

The FRAC Act also places no limitations on or even defines what will be considered a “medical emergency.” If this issue were to be disputed in court after the Administrator of the EPA, or some other entity authorized by the Act, made a determination that a medical emergency existed, it would be very hard to challenge that determination. Based upon *Chevron USA v. Natural Resources Defense Council*, 467 U.S. 837 (1984) the Court will ask if Congress spoke directly to the issue being disputed by requiring the agency to act in a certain way, or where Congress has not directly spoken to the question at issue or there is ambiguity, then the court will ask whether or not the agency’s response is a permissible construction of the statute (*Chevron*, 1984). When considering the agency’s interpretation of a vague statute, the courts will look at the nature of the statute and whether or not the statute dealt with an issue that was technical and complex, the agency considered the problem in a detailed and reasoned fashion, and whether or not the agency’s interpretation involved reconciling conflicting policies (*Chevron*, 1984). The judicial review of the agency action is very deferential given the scope of the authority granted to it by Congress and the agency’s expertise on the subject matter. Also, there is concern as to level of deference that will be shown to a medical professional who makes the determination that a “medical emergency” exists. The proposed legislation seems to be very broad on the medical professional’s level of discretion. That broadness is quite possibly an intentional design of the drafters of the proposed legislation. Basically, as long as the agency’s interpretation of the statute is reasonable, it will be upheld. Under *Chevron*, if the EPA or a medical professional determined that there was a “medical emergency,” then that determination would stick with the force of law.

Environmental Footprint of Hydraulic Fracturing – Methods, Chemicals, and State Regulatory Response

With the exception of coal-bed methane, the producible portions of shale plays lay many thousands of feet below the ground surface (CHK – Barnett Shale, 2009). For example, the pay zones for the Barnett shale, which is between 6,200 and 8,500 feet; the ground water is in the 1,000 foot range, just below the surface (CHK – Barnett Shale, 2009). In the Haynesville shale, the pay zone is between 10,500 and 13,500 feet, again well below the groundwater zones (CHK – Haynesville Shale, 2009). Again, a lot of time and resources are expended in the design of the fracture zone prior to the commencement of fracturing operations. Similar geologic situations exist in the other shale plays across the United States. For example, the Marcellus shale play has a pay zone at a depth of approximately 4,000 to 8,500 feet with groundwater resources being approximately 850 feet below the surface (DOE, 2009). The

Woodford shale play has a pay zone depth of approximately 6,000 to 11,000 feet with groundwater situated approximately 400 feet below the ground surface (DOE, 2009). Oil and gas operators have a huge incentive to make sure that the well does not infringe upon groundwater – in other words, money. Should the well make contact with groundwater, the well would “water out” and cease production.

Drilling for Oil and Gas While Protecting Groundwater Resources

The drilling of an oil and gas well is focused not only on the recovery of oil and gas but on the protection of groundwater resources. The drilling of an oil or gas well involves many interconnected steps. While the steps are common to all oil and gas well drilling operations, there are certain aspects of the construction process that deserve greater attention given their importance in hydraulic fracturing. Of those steps set out above, drilling the well, logging the hole, running casing, cementing the casing, logging the casing, perforating the casing, fracturing the well, and monitoring well performance and integrity are all critically important to hydraulic fracturing operations.

Drilling an oil or gas well is done in stages (API Guidance Document, 2009). The actual drilling of the hole is accomplished through the use of the drill string which is made up of the drill bit, drill collars, and the drill pipe (API Guidance Document, 2009). When drilling an oil or gas well, the drilling is lubricated through the use of drilling mud. Drilling mud or fluid is cutting fluid that is circulated down the drill string and back up the space between the drill string and the hole that is being drilled (API Guidance Document, 2009). The drilling mud is a water based solution that is a mixture of water, clays, fluid loss additives, density control additives, and viscosifiers (API Guidance Document, 2009).

As the drilling progresses, layers or stages of casing are added to the hole. Casing is heavy steel pipe used to seal off the drilling fluids from migration and to keep the wellbore from caving in (Manual of Oil and Gas Terms, 2006). The design and selection of the casing is very important for the drilling and production stages of a well’s life (API Guidance Document, 2009). The casing must be designed to withstand the various pressures and forces that will be encountered as the well is drilled (API Guidance Document, 2009). The casing is a key part of the well structure, ensuring the success of the well by supporting the structure of the wellbore and protecting it from zonal migration of any drilling fluids, ground water, and hydrocarbons (API Guidance Document, 2009).

Chemical Constituents of Fracturing Fluid

In addition to the structural and mechanical safeguards in place in hydraulic fracturing operations, the chemicals used in fracturing are relatively safe given their diluted nature, when used in conjunction with sand and water. According to the Department of Energy and the Groundwater Protection Council, 99.51% of the fluid used in hydraulic fracturing is composed of water and sand (DOE, 2009). The other .49% is made up of chemicals that are found in everyday household items, many of which are ingested or used as make-up (DOE, 2009). There is no one-size-fits all approach to the formulation of the fracturing fluid; the fluid will be made up to suit the formation that is being fractured (DOE, 2009). The chemicals comprising the .49% represent the available chemicals that are most often used. Not all the chemicals will be used at the same time. It is common for service companies performing fracturing operations to omit one or more of the chemicals listed for another listed chemical (DOE, 2009).

The chemicals used in hydraulic fracturing need to be given context. Any chemical, no matter how innocuous it may seem, is potentially harmful. Too much oxygen can cause a fire or make someone pass out; too much salt raises the blood pressure; make-up clogs pores; water treatment facilities use large amounts of chlorine. Chlorine is deadly when handled improperly. Just like any chemical, much hinges upon the manner in which it is handled. A water treatment facility can cause a disaster by mishandling chlorine. Similarly, hydraulic fracturing relies on many chemicals that could be potentially hazardous but are not dangerous when handled safely.

Further, the concentrations of the chemicals used in hydraulic fracturing are so diluted that any potential harm is greatly mitigated. For example, hydrochloric acid is the single largest liquid component used in hydraulic fracturing (DOE, 2009). The acid is a diluted acid solution, meaning that it is 85% water and 15% acid prior to being further diluted with the water and sand in the fracturing fluid (DOE, 2009). What's more, as the fracturing stages are completed, the chemicals are still further diluted. The chemicals will be in their highest concentration at the beginning stages of the fracturing process and in their most diluted at the end of the fracturing process. Because the chemicals are diluted so much and are in such small concentrations to begin with, they pose very little to no risk to ground water.

While the concentrations of the chemicals used in hydraulic fracturing are benign, one might raise the question of what happens to the chemicals when the fracturing process is complete. The chemicals have three options: they can be recycled, left in the fracture, or disposed of. The Ground Water Protection Council estimates that anywhere between 30% and 70% of the fracturing chemicals are

returned to the surface through the wellbore (State Oil and Natural Gas Regulations, 2009). The remaining percentage is left in the fracture. The unrecovered fracturing fluids are typically trapped in the fractured formation through mechanisms such as pore storage and stranding behind healed fractures, separating the chemicals from ground water (State Oil and Natural Gas Regulations, 2009). The vertical distance between the fracture zone and ground water sources, the presence of other geologic zones between the fracture and ground water sources, and the presence of impermeable formations may also serve to prevent migration of the fracturing fluid. The chemicals, if they come up, are then either stored or recycled. Recycling will, of course, further dilute the chemicals. If the chemicals are disposed of, the most common method of disposal is via an EPA classified Underground Injection Control well (State Oil and Natural Gas Regulations, 2009).

When handled properly the chemical concentrations used in hydraulic fracturing do not pose an environmental threat to ground water or the public at large. The bigger concern would be that little caveat “when handled properly.” Sugar is safe, when handled properly. But accidents do happen and people get diabetes. Air is safe but when it’s exposed to fire, it tends to make the fire more potent. Further, once the fracturing fluid is in the ground, some of it will come up and some will remain in the fracture. That should not cause alarm due to the fact that the trapped chemicals will not be going anywhere. The chemicals are geologically stuck in place and will not migrate any further. Also, the chemicals that do come back up and are disposed of, are disposed of in underground storage areas isolated from ground water sources.

State Regulatory Response to Hydraulic Fracturing

Contemporary state oil and gas regulations prohibit harm to the natural environment (State Oil and Natural Gas Regulations, 2009). At one time, however, regulations aimed at protection were not prevalent. From the first oil well in 1859 until the 1930s, there was little state regulation of the oil and gas industry (State Oil and Natural Gas Regulations, 2009). In fact, the majority of well construction operations were geared, not toward the protection of the environment, but to the protection of the asset – the oil and gas reservoir (State Oil and Natural Gas Regulations, 2009). Water was not something to protect, but was something to be protected from; water was the enemy (State Oil and Natural Gas Regulations, 2009). During this infancy of the oil and gas industry, operators thought that the royalties they paid landowners adequately compensated for any damage done to the ground water or the surface by oil and gas operations (State Oil and Natural Gas Regulations, 2009). The damage to the surface was

considered to be a necessary evil inherent in the oil and gas production process (State Oil and Natural Gas Regulations, 2009).

As drilling and production increased through the first three quarters of the 20th century, landowners and regulators became increasingly aware of the environmental impact caused by the under-regulation of the oil and gas industry. Given states' interest in the protection of their respective natural environments and their historical familiarity with the production of oil and gas, states took up the effort to ensure the protection of the natural environment while not hindering the development of oil and natural gas. Oil producing states have since developed a legal infrastructure that ensures environmental protection in conjunction with the development of oil and natural gas. The state approach has been tailored to fit the situational needs of the various states. Because of this tailoring, added levels of federal oversight would be redundant to what states have already implemented. Further, by adding increased federal regulation, the states and the American taxpayer will have to foot the bill for the lost revenue. It is estimated that increased federal regulation proposed under the FRAC act would cost states \$505 million in forgone state income taxes and will cost the federal government \$1.2 billion in forgone federal income tax (New Regulations, 2009). Overregulation of the oil and gas industry proposed in the FRAC Act actually does more harm than good, especially where there has been no documented case of water contamination in over one million fractured wells.

Below is a summary of oil and gas production regulations in some of the oil and gas producing states. The summary will address the issues of groundwater protection, casing procedures and requirements, and cementing.

Alabama

Alabama created the State Oil and Gas Board, vesting in the board the charge of preventing waste and promoting the conservation of oil and gas while ensuring the protection of the environment and the correlative rights of owners (Geological Survey of Alabama, 2009). The oil and gas board has broad statutory authority to promulgate and enforce rules and regulations to ensure the conservation and proper development of Alabama's oil and natural gas resources (Geological Survey of Alabama, 2009).

As the LEAF case suggests, the majority of the hydraulic fracturing in Alabama occurs in coalbed methane. To address the issues that arise with the production of hydrocarbons from coal seams, the state has passed regulations specific to the production of coalbed methane. The state of Alabama's Oil

and Natural Gas Board has the authority to shut down any drilling or production operation for failure to comply with any Board rule (400-1-1-.11, 2000). In addition to that broad authority, any operator producing from coalbed methane shall conduct all oil and gas operations in a manner so as to prevent the pollution of all freshwater resources (400-3-4-.02, 2000); all freshwater that is of present or probable future value shall be confined to the water-bearing strata and the water shall be adequately protected (400-3-4-.02, 2000). Each coalbed shall be hydraulically fractured so as not to endanger any underground source of drinking water (400-3-8-.03(1), 2003). Operators shall certify that the proposed fracturing will not occur in an underground source of drinking water with evidence to support the certification (400-3-8-.03(3), 2003). For wells that are being fractured, before any fracturing operations may commence, the fracturing operation must be approved by the Supervisor of the Oil and Gas Board and each well shall be fractured in a way so as not to cause damage to water bearing strata (400-3-4-.07, 2000). Further, if the fracturing results in any irreparable damage to the well, the well shall be properly plugged and abandoned (400-3-4-.07, 2000). In addition to the fracturing requirements, the operator shall case and cement all wells with a sufficient number of casing strings necessary to prevent the contamination of freshwater bearing strata, support unconsolidated sediments, and to control formation pressure and fluid (400-3-4-.09(1), 2000). The casing used by the operator shall meet American Petroleum Institute standards and shall be reinforced with standard cement that is mixed with water of adequate quality so as not to degrade the setting properties of the cement (400-3-4-.09(2), 2000).

New York

The State of New York sits atop a large portion of the very productive Marcellus shale formation. The New York Department of Environmental Conservation (DEC) has had the exclusive authority to regulate the development of oil and gas since 1981 (Draft SGEIS, 2009). In 1992, New York commissioned the drafting of a generic environmental impact statement (GEIS) to address the DEC's regulations of oil, gas, underground gas storage and solution mining wells of any depth, brine disposal, and stratigraphic and geothermal wells deeper than 500 feet (New York DEC website, 2009). The 1992 GEIS concluded that the issuance of standard, individual oil or gas well drilling permits issued for anywhere in the state, when no other permits are involved, does not have a significant environmental impact (Draft SGEIS, 2009). However, the GEIS did find that the drilling of a oil or gas well within 1,000 feet of a municipal water supply well was always a significant event requiring a supplemental

environmental impact statement addressing the ground water hydrology, potential environmental impacts, and mitigation measures (Final Generic EIS, 1992). The 1992 GEIS further found that the drilling of oil and gas wells between 1,000 and 2,000 feet of a municipal water supply well may be a significant event requiring a site specific environmental assessment and a state environmental quality determination (SEQR) (Final Generic EIS, 1992). The SEQR requires the state to consider the environmental factors associated with oil and gas drilling in the early planning stages of actions that are directly undertaken, funded, or approved by local and state agencies (Final Generic EIS, 1992).

On September 30, 2009 the DEC issued its draft supplemental generic environmental impact statement (DSGEIS) for the potential natural gas drilling activities in the Marcellus shale (Draft SGEIS, 2009). The DSGEIS outlines safety measures, protection standards, and mitigation strategies that operators would have to follow to obtain drilling permits (Draft SGEIS, 2009). The findings of the SGEIS will be applied to the reviewing and processing of permit applications in the deep, low-permeability formations of the Marcellus shale (Draft SGEIS, 2009).

The process envisioned in New York's EIS process emphasizes the importance of studying the potential impacts that drilling and hydraulic fracturing in the Marcellus shale could have. The draft SGEIS is indicative of a state effort to look at an issue that is unique to the state. The EIS process in New York is the product of robust state regulations aimed at the protection of the natural environment and the responsible development New York's natural gas resources. The EIS process is generally applicable to all oil and natural gas operations in the New York but is flexible to allow for exceptions to the general rules as dictated by the circumstances in the field.

North Dakota

The North Dakota Industrial Commission Division of Oil and Gas regulates the production of oil and gas in North Dakota (NDIC, 2009). The purpose of the Division of Oil and Gas is to ensure the development of North Dakota's oil and gas to the fullest extent possible for the benefit of the state of its inhabitants (NDIC, 2009). To that end, the North Dakota Industrial Commission Division of Oil and Gas has passed various rules regarding the production of oil and gas. To protect freshwater sources and oil and gas bearing formations, North Dakota requires that all oil, gas, and water strata above a producing zone be sealed off and separated from the other strata in order to prevent the contents of the various strata from migrating (43-02-03-20, 1992). Like Alabama, North Dakota also requires that all freshwater

of present or probable value be confined to its respective strata and shall be adequately protected by methods approved by the Industrial Commission and special precautions are to be taken to protect artesian water sources (43-02-03-20, 1992). North Dakota further requires that all wells drilled for oil, natural gas, or injection purposes shall be completed with strings of casing which shall be properly cemented at sufficient depths to adequately protect and isolate all formations containing water, oil, or gas or any combination of water, oil, or gas (43-02-03-21, 1992). Further, surface casing must be allowed to stand under pressure until the cement has reached a compressive strength of 500 psi; production and intermediate casing shall be new or reconditioned pipe that has been previously pressure tested to 2000 psi (43-02-03-21, 1992).

Oklahoma

The State of Oklahoma began regulating the production of oil and gas in 1914 through the Oklahoma Corporation Commission (Ok. Corp. Commission, 2009). In 1915, the Oklahoma Legislature passed the Oil and Gas Conservation Act, expanding the role of the Commission to include the protection of the rights of all parties entitled to share in the benefits of oil and gas production (Ok. Corp. Commission, 2009). In addition to the protection of correlative rights, today's Corporation Commission is also responsible for ensuring environmental protection in oil and gas operations (Ok. Corp. Commission, 2009). To achieve adequate protection of the natural environment while encouraging development of oil and gas, the state of Oklahoma has enacted regulations affecting the drilling and completion of oil and natural gas wells. Oklahoma requires that surface casing be run and cemented from the bottom to the top of the casing with a minimum setting depth, which is the greater of either 90 feet below the surface or 50 feet below the base of treatable water (165:10-3-4(c)(1), 2009). The state further requires that an operator shall run and cement the surface casing string before drilling the well more than 250' below the base of the treatable water and the surface casing has to be steel casing (165:10-3-4(c)(5) & 165:10-3-4(c)(7)(D), 2009). When the casing has been run and cemented, the operator shall pressure test the installed casing for 30 minutes at a minimum pressure which is the lesser of the surface gauge pressure equal in psi to .2 of the length of the casing in feet or 1500 psig to ensure the integrity of the casing and cement (165:10-3-4(g), 2009).

Pennsylvania

Pennsylvania holds a special place in the history of the oil and gas industry. It was in Titusville, Pennsylvania that Edwin L. Drake discovered “rock oil” in 1859 (*The Prize*, 1990). Today, Pennsylvania remains important to the domestic oil and gas industry, but not for its rock oil. Instead, Pennsylvania is important because it holds a vast amount of natural gas locked in the state’s portion of the Marcellus shale.

Pennsylvania’s Department of Environmental Protection established the Bureau of Oil and Gas Management to oversee statewide oil and gas conservation and environmental programs designed to facilitate the safe exploration, development and recovery of Pennsylvania’s oil and gas reservoirs in a manner that will protect Pennsylvania’s natural resources and the environment (Pa. DEP, 2009). To help meet these goals, Pennsylvania has enacted regulations aimed at achieving the complementary goals of effective production and environmental protection. When drilling a well, the operator shall install casing that can withstand the effects of pressure, tension, and prevent the burst and collapse of the hole during the installation of the casing, cementing and subsequent drilling and producing operations (25 Pa. Code § 78.84(a), 1989). The operator shall equip the casing string with appropriate equipment to center the casing through the hole in fresh groundwater zones (25 Pa. Code § 78.84(b), 1989). When cementing the casing in place, the operator shall use cement that will resist degradation by the chemical and physical conditions in the well (25 Pa. Code § 78.85(a), 1989). The goal of the casing and cementing operations is to accomplish effective well control at all times, prevent the migration of gas or other fluids into sources of fresh groundwater, prevent pollution or diminution of fresh groundwater, and to prevent the migration of gas or other fluids into coal seams (25 Pa. Code § 78.81(a), 2001). Further, when an operator is drilling through fresh groundwater zones, the operator shall do so with diligence and as efficiently as practical in order to minimize drilling disturbance and commingling of groundwater zones (25 Pa. Code § 78.81(b), 2001).

Texas

The State of Texas has been regulating the oil and gas industry through its Railroad Commission of Texas since the 1910s (State Oil and Natural Gas Regulations, 2009). The Railroad Commission considers the protection of the environment and the preservation of individual property rights to be its two main objectives (History of the Railroad Commission, 2009). To that end, the State of Texas has passed regulations aimed and protecting groundwater in the development of oil and natural gas. Texas requires that upon the abandonment of an oil or gas well, the surface casing is to be left in place in

order to protect freshwater sands (16 Tex. Admin. Code § 3.15, 2009). Further, whenever hydrocarbons are encountered in any well drilled for oil or gas, the fluid shall be confined to its original stratum until it can be produced and utilized without waste (16 Tex. Admin. Code § 3.7, 2009). Each stratum shall be protected from water infiltration and wells may be drilled deeper after encountering the hydrocarbon fluids if drilling is done with diligence and any encountered fluids are confined to their original strata and protected upon the completion of the well (16 Tex. Admin. Code § 3.7, 2009). Texas also requires the use of steel casing that is cemented and hydrostatically tested (16 Tex. Admin. Code § 3.13, 2009).

Wyoming

In July of 2009, the state of Wyoming enacted drilling and production rules specifically for hydraulic fracturing (Wyoming Hydraulic Fracturing Rules and Regulations, 2009). The rules require that information be given to the Supervisor of the Oil and Gas Conservation Commission pertaining to a drilling plan, including any other information that may be required by the Supervisor (Wyo. Admin. Code Ch. 3 § 8(c), 2009). Operators have been informed by Oil and Gas Conservation Commission staff to include detailed information regarding hydraulic fracturing in the application for the permit to drill (Wyoming Hydraulic Fracturing Rules and Regulations, 2009). The rules also set out that approval of the Supervisor must be sought prior to the fracturing of a well (Wyo. Admin. Code Ch. 3 § 1(a), 2009). The notice must include the depth of the perforations, the source of water and/or the trade name of fluids used in fracturing, the types of proppants used, and the estimated pump pressure (Wyo. Admin. Code Ch. 3 § 1(a), 2009). Upon the completion of the fracturing, a report on the operation shall be filed with the Supervisor of the Oil and Gas Conservation Commissioner (Wyo. Admin. Code Ch. 3 § 12, 2009). The report shall be a detailed accounting of the work performed (Wyo. Admin. Code Ch. 3 § 12, 2009). Further, all surface casing shall be run to reach a depth below all known or reasonably estimated utilizable domestic fresh water supplies (Wyo. Admin. Code Ch. 3 § 22(a)(i), 2009).

There is no “one-size-fits-all” approach

In addition to the technical considerations of well drilling as discussed earlier, states play an essential role in the development of oil and natural gas. The FRAC Act is a “one-size fits all” approach to regulation. That approach does not take into consideration the geologic realities facing the states that have been regulating oil and gas production from three-quarters of a century. Because of the states’ knowledge of their respective geologies and their history of effective regulation, the states have a

greater breadth and depth of knowledge on oil and gas regulation than the federal government. Therefore, the regulation of the oil and gas industry and hydraulic fracturing specifically is best left in the hands of states and not the U.S. E.P.A.

IOGCC Response

In January 2009, IOGCC member states passed Resolution 09.011 urging Congress not to remove the exemption of hydraulic fracturing from provisions of the Safe Water Drinking Act (SDWA) because of their belief that the process is already adequately regulated by the states. Key highlights of Resolution 09.011:

The EPA concluded in a 2004 study that “additional or further study is not warranted” for hydraulic fracturing and “the injection of hydraulic fracturing fluids into coal-bed methane (CBM) wells poses minimal threat to Underground Sources of Drinking Water (USDW).”

Hydraulic fracturing is a common operation used in exploration and production for oil and natural gas.

The states, which regulate production, have comprehensive laws and regulations to ensure operations are safe and to protect drinking water. States have found no verified cases of groundwater contamination associated with hydraulic fracturing.

SDWA was never intended to grant the federal government authority to regulate oil and gas drilling and production operations such as hydraulic fracturing under the Underground Injection Control Program.

Hydraulic fracturing plays a major role in the development of virtually all unconventional oil and natural gas resources. Federal regulation of the operation as underground injection under SDWA would impose significant administrative costs on the states and increase the cost of drilling wells with no resulting environmental benefit.

Since IOGCC passage of Resolution 09.011 urging Congress not to remove the exemption of hydraulic fracturing from provisions of the Safe Drinking Water Act (SDWA), six IOGCC member states passed similar [resolutions](#) at the state level.

IOGCC conducted a [survey](#) of its member states in July of 2002 and again in June 2009 to determine the significance of hydraulic fracturing statistically and to determine if the process has caused harm to groundwater.

State oil and gas regulatory authorities weighed in on the issue of hydraulic fracturing by compiling a [fact sheet](#) that includes statements from Alabama, Alaska, Colorado, Indiana, Kentucky, Louisiana, Michigan, Oklahoma, and Texas.

Table 22. State Hydraulic Fracturing Laws and Regulation

Alaska	
Rules and Regulation	
Citation	Alaska Stat. §31.05.030 (j)(2)(a) - (d)
Title	<i>For Exploration and Development Operations Involving Nonconventional Gas</i>
Discussion	This statute lists stipulations concerning permitting, produced water injection, hydraulic fracturing, waste disposal, and water quality related to nonconventional gas exploration and development.
South Dakota	
Rules and Regulation	
Citation	S.D. Admin. R. 74:10:09:12
Title	<i>Secretary to Set Maximum Injection Pressure</i>
Discussion	As the rule was written, the maximum injection pressure could not cause new fractures in the formation into which the fluid is injected. In 2007, the DENR changed the rule so the maximum injection pressure does not cause new fractures in the confining zone. The state believes this change is protective of potential underground sources of drinking water, and is consistent with the surrounding states' Class II requirements and EPA guidance.
Texas	
Tax incentive	
Citation	Tex. Tax Code Ann. § 151.355
Title	<i>Water Related Incentives</i>
Discussion	Tax Incentive for Reuse/Recycling of Fracturing Water – The law provides for an exemption from sales, excise, and use taxes, tangible personal property specifically used to process, reuse, or recycle wastewater that will be used in fracturing work performed at an oil or gas well. Corresponds to House Bill 4.
Wyoming	
Rules and Regulation	
Citation	Chapter 3, Section 8
Title	<i>State of Wyoming Hydraulic Fracturing Rules and Regulations</i>
Discussion	The Oil and Gas Conservation Commission has specific rules regarding the hydraulic

	fracturing permitting and tracking process. Please see the Commission's web page, www.wogcc.state.us for further details either from the Rules and Regulations tab (full rules and regulations language) or from Notices, Memos and Important Details tab (summary of rules), both located on the home page. For a summary of the hydraulic fracturing rules, click the Notices, Memos and Important Details tab, then click on Hydraulic Fracturing Rules and Regulations July 2009.

On January 26, 2009, President Obama stated: "It will be the policy of my administration to reverse our dependence on foreign oil, while building a new energy economy that will create millions of jobs (Remarks on Energy, 2009)."

Both shale gas and oil represent a giant leap forward in the goal of reducing the U.S.' dependence on foreign oil. Unfortunately for the President's policy goals, there are efforts being made in the Congress to thwart his call for energy independence. The FRAC Act, through its misguided and unnecessary proposed regulations of hydraulic fracturing under the Safe Drinking Water Act, will only increase our dependence on foreign sources of oil and natural gas. The oil and natural gas trapped in shale formations would remain trapped because of the added regulatory hurdles that the FRAC Act seeks to impose on the domestic oil and gas production.

Natural gas is a necessary component of a "clean energy future." Without access to the vast amounts of natural gas currently locked in shale formations, a "clean energy future" would remain a pipedream. Progress cannot be made without access to the oil and natural gas indigenous to the United States. Hydraulic fracturing is the key to accessing the nation's energy potential and moving the nation forward on the path toward a clean energy future.

Additional Resources

History of Litigation Concerning Hydraulic Fracturing (2009)

by Marvin Rogers, State Oil and Gas Board of Alabama, Chairman of the IOGCC Legal and Regulatory Affairs Committee.

Just the Facts: a Chronological Look at Hydraulic Fracturing (2009)

Topic Resources

U.S. Environmental Protection Agency, 2004 Hydraulic Fracturing Study. INSERT FACT SHEET
HERE http://groundwork.iogcc.org/sites/default/files/09IOG5571_EPA%20HydFrac_FactSheet_0.pdf

Chapter 4. Water Management

Water management – its use, treatment, and disposal -- is an increasingly important environmental issue associated with oil and gas production. Any discussion of water management technology will be inadequate without a clear understanding of the role water plays and how that water may affect the regions where oil and gas are produced. This section is an introduction to water management that will help the reader understand and evaluate the water treatment technologies covered in this report.

Water is commonly used to stimulate production in either the late stages of primary recovery or as a secondary recovery technique to maximize recovery of a reserve. Hydraulic fracturing involves injecting water into formations to fracture the rock, and adding sand or other propping agents to hold the newly formed fractures open, creating pathways for the hydrocarbons to make their way to the wellbore. A multi-stage fracturing process may consume as much as 6 to 7 million gallons of water, much of which is eventually disposed of in underground injection wells.

In regions where water is scarce, such as the western half of the United States, minimal rainfall and urban sprawl create a situation where many users compete for the same water supply. Water resources stretched by demands for municipal water supplies as well as crop irrigation, power generation, and other industrial uses can make water for well stimulation difficult to come by, or expensive to transport. For this reason, technologies that clean water economically for reuse or recycling benefit the environment, producers, and other users such as farmers and ranchers.

Along with the oil or gas extracted, significant (sometimes prolific) amounts of water come up from the earth as a byproduct of production. This byproduct, commonly referred to as “produced water,” is of major concern due to the sheer volume of water recovered. NETL estimates that the ratio of water to oil or gas is 2:1 to 3:1 worldwide and 7:1 in the U.S., with many older U.S. wells producing 50 gallons of water per gallon of oil recovered (Interstate Oil and Gas Compact Commission and ALL Consulting, LLC, 2006).

Produced water may vary greatly in both volume and the chemical composition of constituents carried along in the water within a single well at different times during its productive life, at different wells within the same field, and from one geographic region to another. Environmentally responsible produced water management is a function of the volume and characteristics of the water as well as economic and region-specific geopolitical factors.

Produced water, once managed almost exclusively as a waste product, is gaining attention as a viable source for municipal and agricultural use. The appropriate treatment for produced water is dependent upon several factors, including quality, volume, and reliability and longevity as a source.

Water quality is generally the first consideration in determining how water from a particular well will be managed. Water naturally picks up minerals, trace elements, and organic matter from the environments through which it travels and the places where it accumulates. Measured in parts per million (ppm), total dissolved solids (TDS) present in the water are an indicator of water quality and its suitability for various uses. The amount of TDS in water generally correlates with salinity. Produced water from oil and gas wells varies from low-saline (low TDS), high-quality water suitable for livestock consumption to very low-quality, high-salinity (high TDS) water that must be carefully managed so that it does not kill vegetation or contaminate freshwater reservoirs or ground water supplies.

Ultimately, it is the potential end use of the water that determines the standard to which it must be treated. In Wyoming, Big Horn Basin farmers and ranchers rely on high-quality produced water that requires very little, if any, treatment as a source for irrigation and livestock watering. At the other end of the spectrum are basins with low quality produced water such as the Anadarko, Permian, Fort Worth and Williston basins of the south-central U.S. The produced water from these basins is often twice as salty as seawater and must be treated before it meets quality standards. The further the divide between initial quality of produced water and its final use, the more complicated—and more expensive—the treatment becomes (Interstate Oil and Gas Compact Commission, and ALL Consulting, LLC, 2006).

In addition to treatment costs, the volume of water required to produce a particular well helps determine the economic viability of recycling water for onsite use. If the source of water is far away or access to large enough quantities is restricted, the cost to recycle the water might outweigh the costs to acquire and transport it. However, the volume of produced water to be disposed of — if it must be moved offsite or injected into onsite disposal wells — might make recycling technologies viable.

The Energy Resources Conservation Board (ERCB) jurisdiction on produced water management is shared with the Alberta Department of Environment. The ERCB requires Alberta oil and gas producers to report all volumes of produced water to the Alberta Petroleum Registry (a large database of oil and gas information). In addition, industry is subject to *Directive 44* that ensures surveillance, sampling and analysis of wells that have perforations above the base of protected ground water. For these types of wells, industry is required to segregate and test geological zones.

In conjunction with Alberta Environment, the ERCB has put in place regulations that ensure that saline water (i.e. salt water) is considered for use in EOR before fresh water sources are utilized. ERCB regulations in this area drive industry to use technology that cleans saline water to industrial use standards for injection within EOR projects. This technology has a further benefit because it recycles used saline water and re-injects it into an oil reservoir for EOR. Similar technology-based approaches are employed in in-situ recovery operations.

Reliability and longevity as a source come into play where a user, such as a manufacturer or electric utility, has a need for water that the byproduct from oil and gas production could have the potential to meet. Produced water generally does not match the reliability and longevity requirements to meet the demand for these types of uses, but through cooperative agreements with other producers and potential end users, produced water could be used to supplement existing sources (Interstate Oil and Gas Compact Commission, and ALL Consulting, LLC, 2006).

Cost is a major consideration for producers, especially the small independent oil and gas companies, many of which typically maintain a staff of fewer than 10 full-time employees. For these companies, which produce approximately 65 percent of the natural gas and 40 percent of the oil in the United States, the upfront costs of water treatment systems, and other technologies for that matter, have to be reasonable and the investment must be recouped over a shorter time span than it is for the major international oil companies. (IOGCC and ALL Consulting, LLC) Also, technology that is affordable when oil is \$100 per barrel might be out of reach when the price drops to \$30 per barrel.

People have been cleaning water for centuries, but the fact is that fresh water remains a valuable commodity even though about 70 percent of the earth's surface is covered by water. Scientists from a broad range of disciplines are working to design and perfect water treatment technologies that are capable of cleaning water economically and in sufficient quantities to meet the demands of human consumption.

Innovative Water Management Practices

The following section covers some of the newest water management technologies that are in use, or being tested for use, in oil and gas production.

Using Produced Water to Grow Algae as Feedstock for Biofuel

“The cost of treating ocean and brackish water has fallen enough that it can be comparable to the expenses associated with developing new freshwater supplies,” Mike Hightower, of Citizens Alliance for Responsible Energy, says. “It used to cost 50 cents per thousand gallons of water to supply freshwater. That is now up to \$3 to \$4 per thousand gallons of water — due largely to the fact that freshwater near cities is generally already being used and utilities frequently have to pump water long distances, often as far as 100 miles, to get new freshwater supplies. This raises the cost of new water supplies and the associated price of water.”

At the same time, the cost of treating saline and brackish water has come down — to \$2 to \$3 per thousand gallons for water being treated at the ocean and \$4 to \$6 per thousand gallons for inland treatment.

“By the mid ‘90s you started to see the increasing costs of freshwater intersecting with the reduced costs of treating saline and brackish water,” Hightower says.

The question frequently asked about desalination, Hightower says, is “Is desalination a silver bullet or pipe dream?

“It’s not a silver bullet and definitely not a pipe dream either,” Hightower says. “It is a reality. In the U.S., desalination treatment has increased by a factor of four over the past 15 years. Desalination is used in nearly all 50 states and in many countries all over the world. It is accepted and can be a cost-effective approach to supplement current freshwater resources and meet our future water supply needs. But there are many issues, such as the environmentally sound disposal of the generated concentrate from desalination, the sustainability of the supply, and the overall treatment costs, that have to be carefully evaluated when looking to develop and implement desalination, especially for inland brackish ground water resources like we have in New Mexico.” (Sandia National Laboratories, 2009)

Downhole Water Separation and Injection

In the waste management hierarchy, eliminating or reducing a waste product is always a best-case solution. Downhole separation units isolate the water from the oil and/or gas and inject it into a non-producing formation above or below the producing formation. The separator is placed in the wellbore and operates using either gravitational or centrifugal force to divide the water and hydrocarbons into separate streams. The viability of downhole separation is influenced by several factors, including:

Zonal Isolation—the injection zone must be discrete from the production zone, must not be subject to connection as a result of fracturing, and must be sufficiently distant from underground sources of drinking water.

Porosity, Permeability, and Storage—the zone must be porous enough to hold the water, permeable enough for it to move, and have enough space. Also, the area must be confined by low permeability zones to prevent migration.

Pressure—the reservoir pressure could limit the rate fluids can be injected or the injection pressure could be too high and cause unwanted fracturing in the rock.

A drawback to downhole separation units is that fine sand and other particles can plug the injection hole and cause it to fail. However, improved filters are making this less of a problem. A great advantage of downhole separation is that the water never comes to the surface so the potential for damage to vegetation or surface waters is minimized.

Membrane Filtration

This process basically pushes water through a membrane. It is the most commonly used water treatment process and is used in a wide variety of applications from water-purification pitchers for home use to municipal wastewater treatment plants. The quality of the end product is basically a function of the pore size of the membrane; particles larger than the pore are trapped in the filter.

Categorized according to pore size from largest to smallest, membrane filtration techniques include microfiltration, ultrafiltration, nanofiltration, and reverse osmosis. Often, water must be processed in stages through progressively finer membranes to avoid fouling (clogging) the membrane. Depending on the makeup of the influent water, the treatment process also might include the addition of chemicals to prevent membrane fouling. Treating water also requires energy to push the water through the filter, and the smaller the pore the larger the energy demand.

Currently, new ceramic ultra- and nanofiltration membranes are in use, and more are under development, because they can be produced from a variety of starting materials, and in a range of chemical and physical forms for diverse applications (Ashaghil, Ebrahimi, and Czermak, 2007).

Electrocoagulation, Thermal Distillation, Aqua-pure Nomad, Freeze-Thaw Technology

Electrocoagulation, thermal distillation, aqua-pure nomad, and freeze-thaw methods are other technologies that may have applications in produced water treatment. Regardless of whether the quality of produced water classifies it as an asset or a waste product, the movement of produced water, as well as stormwater in and around a well site, must be managed to control erosion.

Helicopter Electromagnetic Survey (HEM)

A challenge for state personnel charged with protecting the environment is identifying contaminated areas and locating the origin of pollutants. The Oklahoma Corporation Commission (OCC) has been monitoring streams in and around old oil and gas fields since 1997, according to staff member Patricia Billingsley. Although many Oklahoma streams have naturally high TDS levels, the salinity of produced water from oil and gas wells often is many times higher than seawater. Produced water from spills, leaking pits, improperly plugged wells, or discharge can kill vegetation, accelerate erosion, and contaminate fresh water. While current oil and gas regulations adequately address well casing and plugging procedures and produced water disposal, locating historic or “legacy” contamination helps to protect freshwater resources. Additionally, saltwater damage to soil causes excessive erosion that can continue decades after the pollution occurs.

Reports showed elevated salinity levels in streams in a 1,000 square mile area of south-central Oklahoma. What was not clear was the source. Sampling identified upstream tributaries originating in an oilfield as principle carriers, but locating individual sources would be a laborious process that would include examining aerial photos and other historic data to locate signs of pre-regulatory well sites and walking up streambeds with TDS meters that detect saline due to its highly conductive nature. Ground-level visual searches would be difficult to conduct on the scale required and underground sources such as leaking wells would be impossible to detect.

To speed up the identification of the source type (eroding saline soil from spills, ground water plumes from old pits, etc.) and location, the OCC funded a test run of a Helicopter Electromagnetic (HEM) Survey. Developed by the United States Geological Survey (USGS), the technology uses either frequency domain or time domain electromagnetic surveys. The DOE’s NETL has been using such surveys successfully since 1999 to identify hazards and for mine water remediation efforts.

The Oklahoma HEM survey quickly covered a 25-square-mile area that would have taken OCC employees many weeks to cover on foot. Billingsley, who worked on the HEM project, is working to find

Oklahoma producers who are willing to work with her on conducting HEM on the entire state so that legacy contamination can be found and remediated. She wants to create a program to accomplish this in a way that producers would not be held liable for historic damages that predate the producer's involvement. The incentive for producers is that they would gain valuable data that would help save them money.

In Nebraska, management and allocation of water resources rely on understanding the complex relationships between surface water and ground water systems. HEM Surveys conducted in 2007 and 2008 supported by the USGS were integrated with hydrological and geophysical studies to create a three-dimensional model of the state's water systems, which will enhance the process of water management as it addresses irrigation needs and other environmental issues impacting water systems. (Billingsley & Smith, 2008) (Hammack) States where HEM surveys have been tested endorse their use to survey their water systems and to locate source contaminants as an effective technology that critically improves accuracy and understanding of the hydrology in the state and the hazards that adversely affect it.

Energy Policy Act of 2005 Excludes Oil and Gas Exploration and Production from Clean Water Act, but the States Don't

Pennsylvania has required "Erosion and Sediment Control Plans" and best management practices to reduce environmental impacts on soils and water from oil and gas operators since 1972. So, in 1990 when the federal government issued National Pollutant Discharge Elimination System (NPDES) rules requiring permits for storm water discharges from construction activities, Pennsylvania simply added the NPDES permit to its requirements. When the Energy Policy Act of 2005 came out with exclusions from the Clean Water Act (CWA) for oil and gas sites of less than five acres, Pennsylvania ramped up its environmental protection laws to continue regulating erosion, sediment, and storm water runoff from oil and gas activities. The Pennsylvania Department of Environmental Quality began working on plans to revise the state's Clean Streams Law and Oil and Gas Act to create new permitting requirements and to reiterate its commitment to continued enforcement of its environmental protection laws.

On June 30, 2005, Colorado's storm water regulation went into effect to require Colorado Discharge Permit System (CDPS) authorization from the Water Quality Control Division for storm water discharges from activities associated with small construction (those that disturb between one and five acres) at oil

and gas sites. Permitting for oil and gas construction sites that disturb five or more acres during the life of the project, or are part of a larger common plan of development, has been required since 1992. Although federal permit coverage for these discharges was conditionally exempted from the Federal Clean Water Act by the 2005 Federal Energy Bill, the Colorado Water Quality Control Commission has maintained the requirement within Colorado's regulations, and therefore permit coverage for these activities remains in effect. These requirements are in addition to the requirements of the Colorado Oil and Gas Conservation Commission (COGCC).

Tennessee recognizes the Energy Policy Act of 2005 storm water exemption and, therefore, has not applied NPDES storm water regulation to oil and gas sites. However, Tennessee does apply the NPDES storm water rules to transmission lines, i.e., those lines that extend from compressors to markets. The state also has a NPDES permit for discharges of storm water associated with construction activities, Permit No. TNR 100000, which was issued on June 16, 2005. It was effective on June 17, 2005, and will expire on May 30, 2010

Tennessee Oil and Gas Rule 1040-2.6.04, "Environmental Protection," sets forth statutory authority for preventing and mitigating adverse environmental impacts such as soil erosion and water pollution. The rule states that all areas disturbed by the operation, including access roads, shall be reclaimed. The rule further states that all access roads shall be constructed in such a manner as to reduce erosion to a practical minimum. Sediment ponds, berms, diversion ditches, hay bales, and other measures designed to prevent erosion and discharge from well sites shall be taken to prevent or minimize soil erosion and pollution of surface waters. The state does not have specific regulatory requirements for a formal best management practices.

Finding VI.1. of the state review of Tennessee states "The Review Team finds that the state is doing a good job in developing a storm water management program."

In Wyoming, according to an article in the Caspar Star Tribune, the state Department of Environmental Quality requires all construction activities that disturb at least one acre — including oil and gas projects — to have a storm water pollution prevention plan, said Barb Sahl, the department's storm water program coordinator. "They're required to implement whatever practices are needed to control sediment or pollutants," Sahl said. "When we come out on an inspection, we make sure those practices are there and they are effective."

Sahl contends that regardless of whether oil and gas site construction activities fall under the Clean Water Act, it “would not have an effect in states such as Wyoming, which have adopted requirements more stringent than the EPA rule.”

In anticipation of increased drilling activity in the Marcellus shale, the West Virginia Department of Environmental Protection is releasing new guidelines for water withdrawal, site construction, and fluid disposal that the agency says will “assist well operators in planning for the drilling and operation of these wells and the associated need to dispose/reuse large water volume fracture treatment wastes.” The guidance document is intended to promote best management practices and facilitate compliance with regulatory requirements so that minimum negative environmental impacts result from the increased drilling activity.

Additionally, the Office of Oil and Gas (OOG) is requiring companies to submit additional site-specific information about the proposed activity along with permit applications. This information, which becomes a permanent part of the permit application, makes the operator subject to inspection and enforcement requirements based on the specific information included (West Virginia Department of Environmental Protection, 2009).

Table 23. Water Management Incentives, Laws and Regulations

State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §26-58-209
Title	<i>Cost of Maintaining Saltwater Disposal System</i>
Discussion	Severance tax credit for saltwater disposal costs is available for production from wells that produce both oil or gas and saltwater. Costs include depreciation of cash investment, maintaining and improving the system, costs of services, labor, supplies, utilities and other operating expenses.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-209.htm
State	Louisiana
Category	Tax incentive

Citation	La. Rev. Stat. Ann. § 47:633
Title	<i>Rates of Tax</i>
Discussion	Produced Water Injection. To help accomplish the objective of reducing the discharge of produced water and to help ease the financial burden placed on the oil and gas industry, it is the purpose of this section to provide an economic incentive to producers of oil and gas by allowing them to realize a severance tax savings (20% on incrementally produced oil and gas) if they inject produced water into an oil or gas reservoir for the purpose of increasing the recovery of hydrocarbons.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1357 (2008)
Title	<i>Exemptions - General</i>
Discussion	Sales Tax Exemption for Electricity and Associated Delivery and Transmission Services Sold for Operating of Reservoir Dewatering Project and/or Unit. The increased use of dewatering methods in certain carbonate and shale reservoirs in Oklahoma, which typically have a high water cut during the initial phase of hydrocarbon production, stimulated interest in providing a tax incentive to encourage the use of such technology. Reservoir dewatering projects have substantial costs associated with electricity and associated delivery and transmission services caused by the use of high capacity downhole pumps to accelerate the removal of formation water. Likewise, there is added electricity expense caused by operation of large capacity disposal wells configured to receive the high volume of produced water. Once the water is removed at accelerated rates, oil and gas production, which otherwise would be uneconomical under traditional production methods, has often increased substantially. Also, increased development of natural gas from coal seams in eastern Oklahoma, which involves the dewatering of the coal seam to enhance gas production, spurred interest in this incentive. In some areas of the state, electricity sold by public utilities with certified service territories, is subject to state sales tax. To encourage oil and gas development in such areas, the Oklahoma Legislature enacted S.B. 871 (2002) to provide for the Oklahoma Corporation Commission to classify areas and reservoirs as "reservoir dewatering projects" and/or "reservoir watering units," wherein the statutory criteria of an initial water to oil ratio greater than or equal to five to one (5 to 1) is proved to exist. The regulations implementing S.B. 871 provided for a conversion factor to calculate a water to gas ratio to equate to the 5 to 1 water to oil ratio. Once classified as a "reservoir dewatering project," request is made to the Oklahoma Tax Commission for a sales tax exemption letter, which the operator uses in its relationship with the electricity supplier to gain an exemption of the state sales tax otherwise charged for sales of electricity and associated delivery and transmission services for operation of the project. The goals of the incentive are (1) to increase the use of reservoir dewatering technology

	associated with the drilling, exploration, and production of hydrocarbon resources from certain carbonate, shale, and coal seam reservoirs in the state; and (2) to provide a state tax incentive for such drilling, exploration and production enterprises through a reduction of the state's sales tax burden on the sale of electricity and associated delivery and transmission services, which are an inherently high expense for reservoir dewatering operations.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 151.355
Title	<i>Water Related Incentives</i>
Discussion	Tax Incentive for Reuse/Recycling of Fracturing Water – the incentive provides for an exemption from sales, excise, and use taxes, tangible personal property specifically used to process, reuse, or recycle wastewater that will be used in fracturing work performed at an oil or gas well. Corresponds to House Bill 4.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.151.htm#151.355

Chapter 5. Carbon Capture, Geologic Storage, and Transportation

The geologic storage of CO₂ is among the most immediate and viable strategies for mitigating the release of CO₂ into the atmosphere. Because both the technology used for geologic CO₂ storage and the potential issues related to land use and environmental protection are similar to those associated with oil and gas development, the IOGCC established a CCGS Task Force to examine the technical, policy, and regulatory issues related to the safe and effective storage of CO₂ in subsurface geologic media.

While some argue that governments should regulate CO₂ as a waste product, Task Force members assert that such an approach sidesteps the public's role in both the creation of CO₂ and in mitigating its release into the atmosphere. Further, a waste management model leaves the burden on industry to dispose of a product from which the public must be "protected." Conversely, a resource management framework encourages public and private sector partnership in which every party shares responsibility for reducing and mitigating CO₂ emissions and allows for a unified regulatory framework.

In October 2009, IOGCC member states passed Resolution 09.107 resolving to encourage states, in conjunction with federal initiatives, to develop and adopt safe and environmentally sound regulatory frameworks for all forms of geologic storage of CO₂ as a catalyst for industry to move forward with associated infrastructure and project development.

Key highlights of [Resolution 09.107](#):

EOR with associated storage, geologic storage with incidental hydrocarbon production, and geologic storage in non-hydrocarbon productive reservoirs all constitute forms geologic storage of carbon dioxide.

The language ensures that states have the necessary flexibility in the implementation of future federal regulations, that those regulatory frameworks provide a mechanism for states to apply separately, allowing states discretion in determining which state agencies are most appropriate to administer any federal storage regulations.

Resolution 08.113 was first passed by the IOGCC in October 2004 and has been reauthorized twice, most recently on November 18, 2008. As part of the resolution's action steps, the IOGCC Carbon Capture and Geological Storage (CCGS) Task Force prepared model regulatory guidelines concerning geologic storage to assist member states in regulating the injection and underground storage of CO₂. Key highlights of [Resolution 08.113](#):

The IOGCC urges the U.S. Department of Energy to continue to provide support for IOGCC regulatory projects and initiatives promoting the development of regulatory frameworks and infrastructure to enable development of safe and environmentally sound CO₂ storage and transportation systems.

The IOGCC will continue to provide input to the EPA in the development of rules for the geologic storage of CO₂ and collaborate with EPA, DOE, and others in the areas of policy and technology.

CCGS Rulemaking

In partnership with the New Mexico Institute of Mining and Technology and the DOE, the IOGCC's CCGS Task Force published a model statute and model rules and regulations in late 2007. Since publication of the model rules and regulations, at least 18 states and four Canadian provinces have reviewed the guidance document and at least 11 have moved into legislative discussions. Some states have already passed carbon storage laws.

Table 24. Legislation, Laws and Regulation by State-- CCGS

Kansas	
Rules and Regulation	
Citation	Kansas HB 2419
Title	<i>AN ACT enacting the carbon dioxide reduction act; providing for income tax reductions and property tax exemptions; providing for regulation of carbon dioxide injection wells;</i>
Discussion	The State of Kansas passed HB 2419 in 2007 that mandated development of regulations by July 1 of 2008. The Kansas statute is limited in scope and primarily mandates development of the regulations for CO ₂ injection wells. Regulations have been published and are open for comment. The rules are largely based on the IOGCC model, the state's gas storage regulations, and the UIC Rule proposed by the EPA. A public hearing for K.A.R. 82-3-1117 is scheduled for January 6, 2010.
Louisiana	
Legislation	
Citation	HB 661, Act 517
Title	<i>AN ACT to enact R.S. 19:2(12) and Chapter 11 of Title 30 of the Louisiana Revised Statutes of 1950, to be comprised of R.S. 30:1101 through 1111, relative to the storage of carbon dioxide; to provide for expropriation; to provide for the duties and powers of the commissioner of conservation; to provide for definitions; to provide for public hearings; to provide for enforcement; to provide for compliance orders; to provide for penalties; to provide for certificates of public convenience and necessity; to provide for certificates of completion; to provide for liability; to provide for the Geologic Storage Trust Fund; to provide for fees; to provide for uses of the fund; to provide for accounting</i>

	<i>and reports of the fund; to provide for site-specific trust accounts; and to provide for related matters.</i>
Discussion	The Louisiana Legislature passed this comprehensive bill in 2009 addressing the geologic storage of CO ₂ . A process for developing rules has not yet begun.
North Dakota	
Legislation	
Citation	Senate Bill 2095
Title	<i>AN ACT to create and enact chapter 38-22 of the North Dakota Century Code, relating to the geologic storage of carbon dioxide; to repeal section 38-08-24 of the North Dakota Century Code, relating to priorities in permitting carbon dioxide geologic storage projects; to provide a penalty; and to provide a continuing appropriation.</i>
Discussion	At the request of the North Dakota Industrial Commission a task force drafted legislation covering the geologic storage of carbon dioxide. The task force was made up of representatives of coal mining, electric generation and transmission, their association, oil and natural gas, their association, the state health department, state mineral resources department and the office of the attorney general. In advance of the 2009 legislative session, the Industrial Commission pre-filed the two bills created by the task force, one covering geologic storage, SB 2095, and the other covering core space, SB 2139. Both were passed by the North Dakota Legislature and signed into law by Governor John Hoeven on April 8, 2009.
North Dakota	
Legislation	
Citation	Senate Bill 2139
Title	<i>A BILL for an Act to create and enact a new chapter to title 47 of the North Dakota Century Code, relating to ownership of subsurface pore space; to provide for application; and to declare an emergency.</i>
Discussion	See Senate Bill 2095
Oklahoma	
Legislation	
Citation	Senate Bill 1765
Title	<i>An Act relating to geologic storage of carbon dioxide; stating legislative findings; creating the Oklahoma Geologic Storage of Carbon Dioxide Task Force; stating membership; providing for staffing; requiring appointments by certain date; providing for travel reimbursement; requiring report by certain date; providing for termination of task force; providing for noncodification; and declaring an emergency.</i>
Discussion	Senate Bill 1765 established the Oklahoma Geologic Storage of Carbon Dioxide Task Force with a mandate to submit a report with legislative recommendations by December 1, 2008. Legislation was passed in 2009 that addressed the division of jurisdiction over CO ₂ capture and storage. In March 2009, the Oklahoma Conservation Commission adopted permanent rules that provide a mechanism for the verification of the sequestration of

	carbon dioxide, both terrestrial and geologic.
Oklahoma	
Resource	
Citation	
Title	<i>Oklahoma Carbon Sequestration Verification Program</i>
Discussion	The Oklahoma Conservation Commission has developed a model program designed to help residents take advantage of opportunities created by existing carbon markets. The program is a fee-based service provided to participating aggregators who contract with agriculture producers and forest landowners to sell their offsets. It is also offered to Oklahoma companies injecting CO ₂ underground. Verification adds a layer of assurance that buyers of CO ₂ offsets are getting what they pay for. By developing a program that combines research, natural resource protection, and state-backed verification of carbon offsets, Oklahoma is maximizing the quality of offsets from agriculture, forestry, and geologic sequestration.
Texas	
Legislation	
Citation	HB 469
Title	<i>AN ACT relating to the establishment of incentives by this state for the implementation of certain projects to capture and sequester carbon dioxide that would otherwise be emitted into the atmosphere.</i> <i>relating to the establishment of incentives by this state for the implementation of certain projects to capture and sequester carbon dioxide that would otherwise be emitted into the atmosphere.</i>
Discussion	In Texas, three bills emerged from the 2009 legislative session that address various aspects of carbon capture and geologic storage. The three bills were as follows: HB 469, SB 1387, AND SB 1796. HB 469 relates to the establishment of incentives for the implementation of certain carbon capture and storage projects.
Texas	
Legislation	
Citation	SB 1387
Title	<i>AN ACT relating to the implementation of projects involving the capture, injection, sequestration, or geologic storage of carbon dioxide.</i>
Discussion	In Texas, three bills emerged from the 2009 legislative session that address various aspects of carbon capture and geologic storage: HB 469, SB 1387, SB 1796. SB 1387 identifies regulatory jurisdiction for onshore carbon geologic storage in the state and specifying requirements, including permitting, financial assurance, monitoring and inspection of storage into formations productive of oil or gas, or brine formations above or below oil or gas formations. Jurisdiction is vested in the Railroad Commission of Texas (RRC) except for storage into non-oil and gas producing formations, which must be studied before further legislative action is taken. The RRC is also tasked with adopting geologic storage regulations consistent with eventual EPA rules for geologic storage.

Texas	
Legislation	
Citation	SB 1796
Title	<i>AN ACT relating to the development of carbon dioxide capture and sequestration in this state.</i>
Discussion	In Texas, three bills emerged from the 2009 legislative session that address various aspects of carbon capture and geologic storage: HB 469, SB 1387, SB 1796. SB 1796 relates to the development of offshore carbon geologic storage. The Texas Commission on Environmental Quality is tasked with developing standards and rules for such storage. SB 1796 also requires the TCEQ, the RRC and the Texas Public Utility Commission to participate in the federal government process for developing federal greenhouse gas reporting and registry requirements and requires TCEQ to adopt those requirements by reference.
Texas	
Tax incentive	
Citation	Tex. Tax Code Ann. § 202.0545
Title	<i>Tax Exemption for Enhanced Recovery Projects Using Anthropogenic Carbon Dioxide</i>
Discussion	The law requires the Railroad Commission to issue certification if the CO ₂ used in the EOR project is to be sequestered in a reservoir productive of oil or natural gas. The Texas Commission on Environmental Quality (TCEQ) issues the certification if the CO ₂ used in the EOR project is to be sequestered in a formation other than a reservoir productive of oil or natural gas. Both the RRC and TCEQ issue certifications if the CO ₂ is sequestered in both a formation not productive of oil or natural gas and a reservoir of oil or natural gas.
Washington	
Legislation	
Citation	
Title	
Discussion	In 2007 Washington passed legislation relating to the mitigation of the effects of climate change. The legislation, while addressing geologic storage of carbon dioxide, is focused on emissions reductions. The state subsequently adopted rules (UIC rules) for geologic storage along with companion air quality regulations covering carbon dioxide emissions.
Wyoming	
Legislation	
Citation	HB0017
Title	<i>Carbon Sequestration -- financial assurances and regulation</i>
Discussion	In 2008 and 2009 Wyoming passed five total bills covering general carbon sequestration framework, pore space ownership and utilization. Issues of long-term liability were developed in 2009 with legislation to be considered during the 2010 Legislative session. The referenced citation and title is the Department of Environmental Quality, Water Quality Division, legislation with rule making to be finalized in mid-2010.

	Work is under way to develop a comprehensive Wyoming Oil and Gas Conservation Commission Carbon Sequestration Unitization rule, Chapter 3, Section 44, with completion of the rule-making process anticipated by mid-2010.

SSEB /IOGCC CO₂ Pipeline Transportation Task Force (PTTF)

In April 2009, the IOGCC --- in partnership with the Southern States Energy Board (SSEB) --- created a CO₂ Pipeline Transportation Task Force (PTTF) to examine the legal and regulatory environment surrounding CO₂ pipelines and CO₂ transport. Although the PTTF is separate from the IOGCC CCGS Task Force, coordination and oversight between them is provided through a liaison with the chairman of the IOGCC CCGS Task Force, Larry Bengal, director of the Arkansas Oil and Gas Commission.

The proposed scope of the PTTF report includes a comprehensive review of legal and regulatory barriers and opportunities, legislative implications and opportunities, and the roles of states in regulation of intra-state and inter-state pipelines.

The primary objective of the PTTF is to identify barriers and opportunities for the wide-scale construction of pipelines to transport carbon dioxide for the purposes of sequestration, EOR, and other commercial uses.

INSERT PTTF BACKGROUNDER HERE

http://groundwork.iogcc.org/sites/default/files/PTTF%20Summary%20Backgrounder-09-28-2009_0.pdf

Additional Resources

CO₂ Storage: A Legal and Regulatory Guide for States (2007)

In 2006, the IOGCC CCGS task force began work on Phase II to start development of this [detailed guidance document](#). The most critical components of the full report are a model CO₂ storage statute, a set of model rules and regulations governing the storage of CO₂ in geologic media, and an explanation of those regulatory components. Also included is a report addressing the ownership and right of injection of CO₂ into the subsurface.

CCGS Task Force Phase I Final Report (2005)

This final Phase I report of the IOGCC CCGS, published on January 24, 2005, contains an assessment of the current regulatory framework applicable to CCGS and recommended regulatory guidelines and guidance documents for the states and provinces.

Given the jurisdiction, experience, and expertise of states and provinces in the regulation of oil and natural gas production and natural gas storage in the United States and Canada, states and provinces will play a critical role in the regulation of CCGS. Regulations already exist in most states and provinces covering many of the same issues that need to be addressed in the regulation of CCGS. For this reason the IOGCC formed its CCGS Task Force, which, for the past year, has been examining the technical, policy, and regulatory issues related to safe and effective storage of CO₂ in the subsurface (depleted oil and natural gas fields, saline formations and coal-beds).

Funded by the DOE National Energy Technology Laboratory the Task Force is comprised of representatives from IOGCC member states and international affiliate provinces, state oil and natural gas agencies, DOE, DOE-sponsored Regional Carbon Sequestration Partnerships, the Association of American State Geologists (AASG), and other interested parties.

Framework for Geologic Storage on Public Land

U.S. Department of Interior, U.S. Department of Energy, Environmental Protection Agency, U.S. Geological Survey. Geological carbon sequestration has been discussed as one potential approach to reducing greenhouse gases in our atmosphere. Sequestration of carbon in geological formations on public lands presents many challenges, and it is essential that those challenges be recognized in developing a regulatory framework.

NETL Regional Carbon Sequestration Partnerships

The DOE National Energy Technology Laboratory has formed a nationwide network of regional partnerships to help determine the best approaches for capturing and permanently storing gases that can contribute to global climate change. [The Regional Carbon Sequestration Partnerships \(RCSP\)](#) are a government-industry effort tasked with determining the most suitable technologies, regulations, and infrastructure needs for carbon capture, storage, and sequestration in different areas of the country.

The IOGCC Carbon Capture and Geological Storage Task Force is a member of the [Southwest Partnership](#) as part of a sub-grant through [New Mexico Institute of Mining and Technology](#). The

IOGCC/SSEB Pipeline Transport Task Force is a member of the [Southeast Regional Carbon Sequestration Partnership](#) through a sub-grant of the [Southern States Energy Board](#).

Chapter 6. Marginal and Stripper Wells

IOGCC defines a marginal (stripper) well as a well that produces 10 barrels of oil per day (BOPD) or 60 thousand cubic feet (Mcf) of natural gas per day or less. Generally, these wells started their productive life generating much greater volumes using natural pressure. Over time, the pressure decreases and production drops. That is not to say that the reservoirs that feed the wells are depleted. It has been estimated that in many cases a marginal well may be accessing a reservoir that still holds two-thirds of its initial potential value. However, this depends greatly on the reservoir properties.

Because these resources are not always easily or economically accessible, many of the marginal wells in the United States are at risk of being prematurely abandoned, leaving large quantities of oil or gas behind. Continued production of marginal wells supports the environmental concept of reduce, reuse, and recycle by maximizing use of one resource before moving on to another. The environmental impact of site construction and drilling activities already has occurred, so recovering the remaining reserves before moving on is the right choice.

Marginal well production is a significant factor in the domestic energy picture. Marginal wells are those that produce less than 10 barrels of oil per day or less than 60,000 cubic feet of gas per day. The Interstate Oil and Gas Compact Commission (IOGCC) has monitored production from these wells since the 1940s.¹ Individual wells contribute only a small amount of oil (about 2.5 barrels per day nationally in 2008) but there were more than 375,000 of these wells in the United States, about 5 percent fewer than in 2007. Combined, these marginal wells produced almost 262 million barrels of oil in 2008 – about 20 percent of U.S. production. Marginal gas wells numbered more than 322,000 in 2008 (about the same as the prior year) and produced about 2.1 trillion cubic feet of natural gas (a 23 percent increase over the previous year) – about 19 percent of total U.S. production.

In addition to supplying much-needed energy, marginal wells are important to communities across the country, providing jobs and driving economic activity. Every \$1 million directly generated by marginal production results in more than \$2 million of activity elsewhere in the economy. Additionally, the tax dollars paid in 2007 by marginal producers to states amounted to nearly \$1.3 billion that can be reinvested in states to help communities thrive.

Several states have enacted individual incentive programs intended to promote production from these marginal wells. But there is no broad agreement toward the necessity of these incentives. In the face of lower crude oil and natural gas prices, many of these wells might be abandoned, ending their contribution to domestic production levels and leaving reserves dormant.

It is important from a security standpoint that wells keep producing. From an economic standpoint, marginal wells need to keep producing based upon the number of jobs generated by operation, the impact of production on local and state economies, and the fact that much of the U.S. energy economy is dependent upon marginal well production.

Technology has become vitally important because it is the key to keeping operating costs down and to boosting production from marginal wells. State governments also have a role in ensuring the success and safety of a domestic energy infrastructure via state tax regimes. Congress is considering legislation to help keep the taxes on marginal well production low. These three forces are working together to keep “home wells flowing” and to promote a secure energy future for the United States.

Marginal Producers: Independent, Localized, Making a National Difference

Small, independent companies are the largest producers of marginal oil and gas and are the heart of the domestic oil and gas industry (Stripper Well Consortium, 2005). An Independent Petroleum Association of America (IPAA) survey conducted in 2009 found that stripper well production accounted for 80% of small independents’ oil production and 67.5% of natural gas production; for mid-sized producers, 40% of oil production and 50% of natural gas production came from marginal wells. (Independent Petroleum Association of America, 2009).

In the fall of 2008, the economic crisis that began in late 2007 hit the oil and gas industry, and the price of oil fell to just above \$48 per barrel. Unfortunately, marginal producers live and die by the margins. A “breakeven analysis” found that for marginal producers to match production costs, the price of oil and gas had to be at or above \$44.73 per barrel of oil and \$4.66 per uneconomical to produce, they are threatened with premature plugging and abandonment, leaving vast amounts of oil and gas trapped in the ground (Interstate Oil and Gas Compact Commission, 2008). At those prices, there were some marginal producers who survived and there were others who could not operate. (State of Oklahoma Commission on Marginally Producing Wells, 2009)

Technology and Marginal Producers: The Laboratories of Production

Technology is the key to allowing marginal producers to boost production. Marginal producers typically do not have the budgets for research and development (Stripper Well Consortium, 2005), and federal funding for research and development has been reduced. (Interstate Oil and Gas Compact Commission, 2008) A key stakeholder and facilitator in the development of marginal recovery technology is the Stripper Well Consortium that was founded in 2000 to facilitate the transfer, development, demonstration, and deployment of new technologies needed to increase recovery and lower production costs. (Stripper Well Consortium, 2005) The SWC does this through the pooling of financial resources and co-funding projects with the DOE through the National Energy Technologies Laboratory, New York State Energy Research and Development Authority (NYSERDA) and Penn State University. (Stripper Well Consortium, 2005)

The SWC works in four broad areas: reservoir remediation; wellbore liquids removal and cleanup; surface system optimization; and environmental work. (Interstate Oil and Gas Compact Commission, 2008) Since its establishment, the SWC has helped to fund more than 95 projects aimed at helping marginal producers. (Interstate Oil and Gas Compact Commission, 2008)

One of the biggest and most costly problems that marginal producers face is how to deal with produced water. Produced water accumulates in flow-lines or builds up at the bottom of the well, dramatically reducing the flow rates of oil and gas. In 2002, the SWC funded a project in conjunction with Vortex Flow, LLC to help solve this water transportation issue. (Stripper Well Consortium, 2005) The project resulted in the development of the Vortex Flow SX Unit for flow-lines. The tool allows for the reorganization of streams to allow for the separation of gas and liquid. The liquids move along the outside of the pipe while the gas moves along the inside. (Stripper Well Consortium, 2005) This reduces the drop in pressure between gathering points in the pipeline system. (Stripper Well Consortium, 2003) In January of 2008, the Rocky Mountain Oilfield Testing Center reported that Vortex Flow had contacted the center to conduct testing of its units in high flow rate gathering systems. (Milliken, Mark; Rocky Mountain Oilfield Testing Center, 2008) It was shown that the Vortex Flow Units will help increase flow rates. (Milliken, Mark; Rocky Mountain Oilfield Testing Center, 2008)

In addition to the Vortex Flow SX Unit, the SWC, in conjunction with NYSERDA, BEDCO, and NETL, combined funding for the development of a tool that utilizes the natural pressure in the wellbore to lift the water out of the well on a regular basis. (Stripper Well Consortium, 2005) This tool, called the “Gas-Operated Automatic Lift,” allows for the automatic lifting of saltwater out of the wellbore with the

subsequent improvement of natural gas production. (Stripper Well Consortium, 2005) Initial testing showed an increase in gas production from 1100Mcf/year to an estimated 3416Mcf/year with payout expected in less than a year. (Stripper Well Consortium, 2005) At the conclusion of field tests, NETL concluded that “the need for and applicability of a Gas Operated Automatic Lift Petro-Pump for removal of fluids from a significant portion of stripper wells...has been proven by this field-applied research for the oil and gas wells of America and the world.” (Stripper Well Consortium, 2005) In addition to the tests and data compiled by the developers of the tool, NETL also found that gas production was increased in stripper wells that used the tool. For the majority of sites where the tool was tested, the wells saw an increase in production between 60% and 300%. (Stripper Well Consortium, 2005)

Another problem associated with water infiltration that can restrict the economics of marginal production is the disposal of produced saltwater. Historically, produced water has been viewed by most as a waste stream that must be disposed of. (Stripper Well Consortium, 2005) That viewpoint has changed, leading some to the belief that produced water is not a waste, but has marketable benefits. (Stripper Well Consortium, 2005) To help deal with the problem, Texas A&M developed a trailer that allows for the treatment of produced saltwater. The trailer essentially acts as a water-recycling facility with the end product being marketable fresh water. (Stripper Well Consortium, 2005) In conjunction with Texas A&M, SWC worked on studying the environmental and regulatory issues relating to the use of produced water. Texas A&M developed guidelines for companies to follow for making this new source of fresh water available for productive use. The guidelines have resulted in the development of technology accepted by the Railroad Commission of Texas, the Texas Water Development Board, and the Texas Committee on Ground Water Resources for the treatment of produced water. (Stripper Well Consortium, 2005)

Technology and Environmental Protection

The goal of the IOGCC is the fulfillment of its core values --- conservation and the efficient recovery of natural resources. Paramount in that mission is the concept of reducing, reusing, and recycling, which are the goals of conservation and conscientious development. The IOGCC and various state and federal regulatory authorities share a common goal: the protection of the environment. As the focus of the oil and gas industry shifts toward conservation and environmental protection and the regulatory environment becomes more attuned to the needs of our shared, fragile environment, technology will

play a key role in the facilitation of safe and effective operations, keeping operators always mindful of their bottom line but more importantly of their impact on the environment.

With that in mind, regulators continue to take a balanced approach in the regulation of oil and gas operations. The goal of regulators and the oil and gas industry is the protection of our collective health, safety, and environment. Regulators and operators understand that fundamentally they work together although they are seemingly at odds with each other. Working in tandem, regulators and the industry have developed a symbiotic relationship, with each sector encouraging the other to perform its role a little better with each passing year. Industry can better itself by rising to the challenges of needed regulations through the effective development and use of technology to protect operations and, more importantly, the environment.

The “gusher,” once a sign of drilling success, is now a thing of the past. With rising prices and mounting concern over the environment, operators are now taking appropriate measures to mitigate their environmental impact and to boost production. Changing focus has not been cheap, though. The cost of environmental compliance has risen steadily and it is now estimated that the U.S. oil and gas industry spends \$9 billion on environmental compliance, with that number likely to increase. (U.S. Department of Energy Office of Fossil Energy)

Rising regulatory costs are a concern for the industry as a whole but are of special significance to marginal producers that typically are small and do not have the capital or wherewithal to handle rising costs as effectively as the large operators. To help mitigate the costs of environmental compliance, technology is key. To facilitate development of technology, to reduce environmental impacts and to boost overall recovery in an environmentally sound fashion, industry and government have come together to address the issues associated with environmentally sound development of oil and gas resources. Technological advances resulting from the collaboration of industry and government are making exploration, production, and processing cheaper and more protective of the environment. An example of the collaboration is the development of the “LINGO” system by the DOE’s Office of Fossil Energy. The Low-Impact Natural Gas and Oil initiative integrates current technologies and practices in ways that minimize the adverse environmental effects of oil and gas production. The goal of LINGO is to show that low-impact oil and gas technologies can be developed and deployed in environmentally sensitive areas. (U.S. Department of Energy Office of Fossil Energy)

Another project sponsored by the DOE that addresses environmental concerns associated with the production of oil and gas is the “stranded gas” project. Stranded gas is natural gas that is uneconomical to produce. Typically, there are three ways to deal with stranded gas: the gas can be vented or flared; it can be re-injected; or the well can be shut in. The options are not desirable, either coming at a cost to the environment (venting into the atmosphere) or to the operator (re-injection costs or shutting in the well) or to the public (venting into the atmosphere and leaving needed hydrocarbons in the ground). The project is called Oil Field Flare Gas Electricity Systems (OFFGASES) and it is turning waste gases into a valuable fuel for power generation at marginal well sites in California. Oil production sites use a lot of electricity and in some cases electrical costs can be onerous enough to make the well too expensive to operate, especially for marginal producers. The DOE estimates that electricity consumption can account for as much as 40% to 60% of the operating costs of wells. The OFFGASES project uses microturbines to employ the stranded gas to generate electricity to be utilized at the well site, usually costing 20% to 40% less than the electricity pulled from the grid. The project is increasing production in fields that were all but forgotten. (U.S. Department of Energy National Energy Technology Laboratory, 2007)

Air quality issues affect marginal producers as well. Generally speaking, the oil and gas industry emits significantly less pollution than many other industries. Because of the oil and gas industry’s historically low emissions, state and federal regulatory agencies typically have focused their efforts on the large sources of air pollution. However, as those larger point sources have been brought into regulatory compliance, regulators have focused on aggregate air pollution from smaller, movable sources, including the oil and gas industry. Most small operators don’t have designated departments to deal with environmental regulatory compliance. To these small producers, air pollution regulations and permitting requirements can seem complex. To help operators navigate the complexities of air pollution regulation, the EPA has established a low-tech, yet effective, method of helping underfunded producers. They are called Compliance Assistance Centers, which help various industries understand their environmental obligations. (Interstate Oil and Gas Compact Commission, 2009) Compliance Assistance Centers provide advisers to assist regulated businesses in bringing their operations into regulatory compliance through one-on-one contact, usually in the form of workshops and demonstrations. To help in planning for compliance, the EPA also has made available a financial planning tool that helps communities and industry plan for the costs associated with compliance. (U.S. Environmental Protection Agency, 2009)

Federal Tax Incentives

The federal government addressed tax incentives for marginal well production in 1998. H.R. 3688 amended the Internal Revenue Service Code of 1986 by providing a tax credit for marginal oil and natural gas well production. The current federal tax credit for marginal oil and gas wells is \$3 per barrel of qualified crude oil production and 50 cents per 1,000 cubic feet of qualified natural gas production. The bill provides for a reduction in the tax credit as market prices increase, calls for an adjustment in the credit amount to account for inflation, and sets a limitation on the amount that can be produced from a marginal well at 1,095 barrels or “barrel equivalents.” Barrel equivalent is defined as a conversion ratio of 6,000 cubic feet of natural gas to one barrel of crude oil. (H.R. 3688, 105th Congress)

The fate of federal incentives is uncertain, though. The first session of the 111th Congress saw the introduction of legislation to terminate the marginal well tax incentives. (S. 888, 111th Congress; see also S. 1087, 111th Congress) In addition to the proposed legislation, on February 26, 2009, President Obama unveiled his \$3.6 trillion budget for the upcoming fiscal year. The administration’s proposed budget calls for the elimination of “oil and gas preferences” estimated to be worth more than \$31.48 billion over 10 years in addition to raising other taxes on the oil and gas industry. (Divisions form over oil, gas provisions in Obama budget, 2009) It is hoped that by removing the federal tax incentive for oil and gas production the current level of “excessive” investment in oil and gas operations would be curtailed, carbon emissions would be reduced, production of renewable fuels would be increased, and tax subsidies would be redirected from the oil and gas sector to “more productive uses.” (Energy Policy Research Foundation, Inc., 2009)

The proposed budget has drawn criticism not only from professionals in the oil and gas industry but from ranking members of Congress and various executive officials on the state level. One senator characterized the proposed budget as an “attempt to drive the oil industry overseas through a combination of breaching past agreements the government has made with oil and gas producers and making future production more difficult and expensive.” (Divisions form over oil, gas provisions in Obama budget, 2009) Another senator stated the proposed budget was “an honest and balanced blueprint for America’s future” but expressed concern on what the budget could mean for the domestic oil and gas industry, stating, “in these tough times we do not need to disadvantage our domestic energy industry, which is critical to the nation’s security, against foreign competitors.” Another senator added his concern, stating: “In the United State, there are nearly 6 million Americans directly and indirectly

employed as a result of the oil and gas industry. Tax increases of this magnitude will significantly curtail the operating budgets of all exploration and production companies, big and small. Every marginal well operator in the country should be gravely concerned that these proposals will force the premature plugging of low-production marginal wells.” Highlighting the importance of hydrocarbon production in bridging the gap between a hydrocarbon present and a “green future,” David Holt, president of Consumer’s Energy Alliance, said, “The realization of an alternative energy future will not be achieved by making a reliable energy present impossible.” My fear is that a number of the provisions in this budget would do precisely that at precisely the wrong time for struggling consumers and a flagging economy.” (Divisions form over oil, gas provisions in Obama budget, 2009)

In addition to the concerns expressed by those in Congress and the industry, state officials also have voiced their concerns over the President’s proposed budget. In a letter dated April 16, 2009, addressed directly to President Obama, the commissioners of the Oklahoma Corporation Commission stated that the energy taxes in the proposed budget would have a disastrous effect on the Oklahoma economy, having dire consequences for the state’s education budget, the state’s environmental clean-up efforts, and its job creation programs. The letter lays out the effects that the proposed budget would have on the industry within the state. Oil and natural gas production provides 10% of state-apportioned dollars for education in Oklahoma, and funding for environmental clean-up of abandoned well sites and land remediation is pegged directly to revenues from oil and natural gas production. Approximately 16% of Oklahoma’s gross state product comes from the oil and gas industry, with much of the production coming from stripper wells. The repeal of the intangible drilling costs, the percentage depletion allowance, the marginal well tax credit, and the EOR tax credits would have serious consequences for the state of Oklahoma’s budget. (State of Oklahoma, Oklahoma Corporation Commission, 2009) When asked about the President’s proposed budget, Corporation Commission Chairman Bob Anthony stated:

“The administration’s defense of its approach is that this strategy is necessary to decrease our dependence on foreign oil. The tragedy is that this will, in fact, increase our dependence by driving America’s domestic producers out of business.”

Commissioner Jeff Cloud drew comparisons to the Carter administration’s windfall profits tax on energy producers, citing that much of the rhetoric from the Carter administration is mirrored by the Obama administration with both stating the extra revenue from the increased taxation could be used to fund alternative energy and reduce our dependence on foreign oil. Commissioner Cloud points out that

under the Carter administration's plan, U.S. "dependence on foreign sources grew by thirteen percent and tax revenue from the industry decreased because domestic drilling budgets were slashed in order to meet the extra tax burden." Commissioner Dana Murphy acknowledged the need to keep developing alternative energy resources but noted "we also have a very real need for oil and natural gas. Our domestic supplies are critical to meeting that need." (Hunt, 2009)

Other states have voiced concern similar to the Oklahoma Corporation Commission. Bill Sydow, a member of the Nebraska Oil and Gas Compact Commission, stated that the commission does not view the current depletion allowance and intangible drilling costs as "incentives" but necessities for a healthy oil and gas industry in the United States. Sydow expressed concern that "if these allowances are taken away...drilling activity in Nebraska would virtually cease." Herschel McDivitt, of the Indiana Department of Natural Resources, stated: "Any tax incentives that would substantially increase tax liabilities or significantly reduce existing tax incentives for independent oil and gas producers would have a drastic negative effect on Indiana's oil and gas industry." Brandon Nuttall, of the Kentucky Geological Survey, said that "getting rid of windfall profits, depletion allowances, and others [tax incentives] might look good when touting billion dollar profits for giant international firms, but these incentives can keep small operators in business." (Interstate Oil & Gas Compact Commission, 2008)

The purpose of increased taxes is to increase state and federal revenue. Increased tax revenues from the removal of upstream production incentives will be offset through the loss of domestic production and exploration. Particularly important to marginal producers is the threatened repeal of the percentage depletion tax credit. For marginal producers, cash flow is crucial in keeping high-cost operations running. The percentage depletion tax incentive entitles marginal producers to a tax deduction based upon the well's gross income. This incentive helps with marginal producers' cash flow, allowing them to reinvest in the maintenance of their wells and the expansion of their operations. (Energy Policy Research Foundation, Inc., 2009)

Approach of the States

With the increase in energy prices that began in the late 1990s and ended dramatically in the fall of 2008, there was basic economic incentive for operators to produce marginal wells – the profits from marginal well production easily outweighed the cost of production. Now with depressed energy prices, the basic economic incentive is no longer present. Consequently, investment in marginal wells has

slowed dramatically and in some cases, has ceased, leaving the majority of oil or gas trapped in the reservoir. In an effort to shore up production from marginal wells and to encourage continued investment in marginal well production, many states have taken to offering production incentives for marginal wells by utilizing tax credits. The general purpose of the tax reductions is to make production cheaper, usually by calling for a percentage reduction in the taxes paid on production from the marginal wells.

To support marginal well production in Alaska, the Legislature has approved a reduction on royalty payments. This law gives the Commissioner of Natural Resources the right to determine royalty rates for uneconomical oil and natural gas resources. (Alaska Stat. § 38.05.180 (2009)) The goal of this law is to bring known marginal resources into production and temporarily extend the life of production that is about to be abandoned.

Louisiana has taken steps to ensure production from marginal gas wells by enacting a law that allows wells that produce less than 250 mcf/day to be taxed at a reduced rate of \$.013/mcf. (Louisiana Rev. Stat. Ann. § 47:633(c)(2009))

Oklahoma has taken measures to make sure marginal wells keep producing. The Legislature established the Oklahoma Commission on Marginal Wells, which collects and distributes information on stripper production and performs many other activities and functions that are vital to stripper well production. The state also has taken steps to protect economically at-risk oil leases. Operators of at-risk leases can apply to the Oklahoma Tax Commission for a rebate of 6/7ths of the gross production tax upon demonstrating that they operate a lease that is economically at-risk. (Oklahoma Stat. tit. 68, § 1001.3a (2005))

The Railroad Commission of Texas has the authority to exempt marginal gas wells from otherwise applicable production limitations so long as the wells are located in fields without special field rules. (Texas Nat. Res. Code Ann. § 86.091 (2009)) The purpose of this authority is to relieve the regulatory burden of testing marginal gas wells. This raises the production limitations on wells and reduces industry expense associated with the testing of gas wells.

In addition to the exemption for marginal gas wells, the Texas School Land Board may grant reduced royalty payments for a period of two years for marginally economical state leases. If at the end of two years, the well is still marginally economical, the operator may reapply for another two-year period of

royalty reduction. (Texas Nat. Res. Code Ann. § 86.091 (2009)) The statute is designed to extend the lives of leases on state land to keep royalty payments coming into the state and to keep the wells from being shut-in and abandoned.

Texas also allows for tax credits on low-producing wells to make low-producing wells economical to boost the recovery of the state's mineral resources. The Texas Tax Code provides three levels of taxation based upon the market price for oil or gas. (Texas Tax Code Ann. § 201.058 (2009))

The spike in oil and gas pricing after mid-year 2008 and the subsequent crash by years-end has caused concern regarding how many wells will be shut-in as uneconomical. Wyoming has seen an increase in shut-in or idle wells specifically within the first 6 months of 2009. In addition, low natural gas prices may force viable companies into bankruptcy, increasing the number of orphaned wells that would need to be plugged, abandoned, and reclaimed by the Wyoming Oil and Gas Commission, thereby putting the burden of remediation on the state.

Table 25. State Incentives, Laws and Regulations for Marginal/Stripper Wells

State	Alabama
Category	Tax incentive
Citation	Ala. Code § 40-20-2(a)(3) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Reduces the privilege tax to 4% of value on wells producing 25 barrels of oil or less per day, or 200 Mcf per day of natural gas.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
State	Alaska
Category	Tax incentive
Citation	Alaska Stat. § 38.05.180(f)(6)
Title	<i>Oil and Gas and Gas Only Leasing</i>
Discussion	The statute reduces royalty for oil from platforms in the Cook Inlet Basin that produce less than 1,200 bpd.

URL	http://www.touchngo.com/lglcntr/akstats/Statutes/Title38/Chapter05/Section180.htm
State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1002
Title	<i>Tax Incentives — Re-establishment of Inactive Wells and Fields</i>
Discussion	The severance tax is reduced from 5% to 4% for marginal wells, which are defined by the state as wellsthat produce an average of less than 10 barrels of oil per day during any calendar month.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1002.htm
State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §26-58-111
Title	<i>Rates of Tax</i>
Discussion	Marginal Gas Wells. there is a reduction in the severance tax from 5% to 1.25% for conventional sources of supply producing less than 100 Mcf/day and for unconventional and tight sand sources of supply producing less than 250 Mcf/day.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm#http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm
State	Colorado
Category	Tax incentive
Citation	Colo. Rev. Stat. § 39-29-105
Title	<i>Tax on Severance of Oil and Gas</i>
Discussion	Oil and gas income from "stripper wells," i.e., wells that produce an average of 15 barrels or less of oil per producing day or 90,000 cubic feet of gas per producing day, is exempt from severance tax. A tax credit is available for 87.5% of ad valorem tax.
URL	
State	Florida

Category	Tax incentive
Citation	Fla. Stat. Title XIV, § 211.02, and Chapter 86-178 (1986)
Title	<i>Oil Production Tax; Basis and Rate of Tax; Tertiary Oil</i>
Discussion	Marginal/Stripper Wells. The severance tax is reduced from 8% to 5% for oil wells producing less than 100 barrels per day. Stripper gas is taxed at \$0.12 Mcf.
URL	
State	Kansas
Category	Laws and Regulation
Citation	Kan. Admin. Regs. §82-3-304
Title	<i>Tests of Gas Wells; Penalty</i>
Discussion	Tests of Gas Wells. This regulation increased the daily minimum gas allowable in Kansas from 150 to 250 Mcf per day and exempts such minimum gas wells from the burden of annual gas well testing (including the required 72-hour shut-in period). It requires that the operator must apply for the exemption and annually report to the Kansas Corporation Commission the well head shut-in pressure for such minimum wells that have been exempted. This includes all coal seam gas wells and conventional gas wells that produce less than 250 Mcf per day. This incentive is designed to minimize the loss of gas production sales and associated expenses of the gas well test (pulling unit time, labor, etc.) for minimum wells.
URL	http://www.kcc.state.ks.us/conservation/cons_rr_110308.pdf
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217(b)(1)
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	Marginal/Stripper Wells. The existing severance tax exemptions for marginal/stripplier wells was expanded to increase exemptions and to allow for further increases in exemption amounts if oil prices decrease. The two barrels of oil per day exemption on oil produced from a lease or production unit increased to an average daily production of five. The three-barrel exemption for wells with a completion depth of 2,000 feet or more increased to an average daily production of six barrels per day. Further exemptions were provided for if the price of oil decreases. Oil priced at \$16 or less now has a seven barrel exemption; should oil drop to \$13 per barrel, the exemption is 10 barrels. Tertiary recovery from a waterflood process from wells of 2,000 feet or less now has a six barrel exemption and wells in excess of 2,000 feet have a

	seven barrel exemption. The exemption is 10 if the oil price reaches \$14 per barrel. Tertiary recovery oil priced at \$16 or less now has an eight barrel exemption and \$14 oil would have a 10 barrel exemption. The exemption for gas severed from a well having a gross value of not more than \$81 per day during a calendar month was increased to \$87
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217(b)(2)
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	See Kan. Stat. Ann. § 79-4217(b)(1)
URL	
State	Louisiana
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633
Title	<i>Rates of Tax</i>
Discussion	The statute reduces severance taxes on the following categories of wells to stimulate exploration and development of horizontal, new discovery, deep gas, or condensate wells. Stripper Oil Wells. Severance taxes on the following categories of wells were reduced to stimulate exploration and development: (1) Stripper Oil Wells and Incapable Oil Wells producing less than 10 barrels of oil per day are exempt from severance taxes during any month in which oil prices average less than \$20 per barrel. When oil prices are greater than \$20 per barrel, the severance tax is reduced by 7.5% to 3.125%. Wells producing more than 10 and less than 25 barrels of oil per day with at least a 50% saltwater cut are taxed at 6.25%, a 50% reduction. Marginal Gas Wells. Gas wells producing less than 250 Mcf per day are taxed at a reduced rate of \$0.013/Mcf.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399
State	Michigan
Category	Tax Incentive
Citation	1929 Mich. Pub. Acts 48

Title	<i>Marginal/Stripper Wells</i>
Discussion	Severance taxes are reduced from 6.6% to 4% for production from stripper oil wells. The severance tax rate for all gas production is 5 %. Stripper oil wells are defined by the state as wells with an average maximum daily production less than or equal to 10 barrels per day. Production from marginal oil properties receives the same reduction when average per well production is: 20 barrels or less for properties with average completion depths greater or equal to 2,000 feet but less than 4,000 feet; 25 barrels or less for properties with average completion depths greater or equal to 4,000 feet but less than 6,000 feet; 30 barrels or less for properties with average completion depths greater or equal to 6,000 feet, but less than 8,000 feet; 35 barrels or less for properties with average completion depths of at least 8,000 feet.
URL	http://legislature.mi.gov/doc.aspx?mcl-act-48-of-1929
State	Montana
Category	Tax Incentive
Citation	Mont. Code Ann. § 15-36-304 (1995)
Title	<i>Production Rates Imposed on Oil and Natural Gas - Exemption</i>
Discussion	Marginal/Mini Stripper Wells (three barrels per day or less). Oil from a well which produces three barrels per day or less is exempt from production taxes, except the 5% resource indemnity tax. A suspension clause eliminates this tax exemption when West Texas Intermediate crude oil prices reach \$38 per barrel for a calendar quarter and reactivates when the price drops below \$38 per barrel. Stripper oil wells are defined as those producing 15 barrels per day or less. Marginal/Stripper Wells (10 -15 barrels per day). The production tax rate on the first 10 barrels produced from a stripper oil well is 5.5%. The production tax rate is 9% on the next 10 to 15 barrels. Lower tax rates are provided for stripper well production when the price of West Texas Intermediate crude oil remains below \$30 per barrel in a calendar quarter. Montana defines a stripper oil well as a well that produces less than 15 barrels per day.
URL	http://data.opi.mt.gov/bills/mca/15/36/15-36-304.htm
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-701
Title	<i>Terms, defined.</i>

Discussion	A severance tax reduction from 3% to 2% is available for oil wells that produce less than 10 barrels per day.
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-702
Title	<i>Tax; levy; persons liable; due and payable; lien.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-703
Title	<i>Tax; levy on resources severed; rate.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-704
Title	<i>Taxes; payment; time; statement; filing; form; contents.</i>

Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-705
Title	<i>Tax; remittance; Severance Tax Fund; Severance Tax Administration Fund; created; use.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-706
Title	<i>Tax; security; notice; use.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-707
Title	<i>Reports; payment of tax.</i>
Discussion	See Neb. Rev. Stat. § 57-701

URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-708
Title	<i>Tax; deductions permitted.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-709
Title	<i>Tax; delinquent; action.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-710
Title	<i>Tax; when delinquent; interest; penalty.</i>
State	New Mexico
Category	Tax Incentive

Citation	7-29B-1 NMSA 1978
Title	<i>Stripper Well Tax Incentive</i>
Discussion	Marginal/Stripper Wells. The incentive reduces both severance and emergency school taxes for stripper well properties having average daily production of less than 10 barrels or 60 Mcf per eligible well. Severance taxes are reduced from 3.75% to 1.875% or 2 13/16% and emergency school taxes are reduced from 4% to 2% or 3% for gas and from 3.15% to 1.58% or 2.36% for oil during periods of low prices (less than \$1.15 and between \$1.15 and \$1.35 per Mcf for gas and less than \$15 and between \$15 and \$18 per barrel for oil).
URL	
State	New Mexico
Category	Laws and Regulation
Citation	N.M. Stat. Ann. § 19-10-5.1
Title	<i>Amendment of Lease to Lower Royalty Rate for Oil Wells Under Certain Conditions</i>
Discussion	State Royalty Reductions. A lower royalty rate (5%) applies to oil wells operated pursuant to a state oil and gas lease if the wells averaged: (i) less than 3 barrels per day for the preceding 12-month period but not more than 5 barrels per day for any month during that 12-month period if producing from shallower than 5,000 feet; and (ii) less than 6 barrels per day for the preceding 12-month period but not more than 10 barrels per day for any month during that 12-month period for production from 5,000 feet or deeper. Certain conditions apply and an application and fee are required.
URL	http://legis.state.nm.us/Sessions/99%20Regular/FinalVersions/house/HB0653.pdf
State	North Dakota
Category	Tax Incentive
Citation	N.D. Admin. Code § 81-09-03-07
Title	<i>Stripper Well Exemption</i>
Discussion	Stripper Well Property Determination (No Trigger). This section outlines the requirements for an operator desiring to classify a property as a stripper well property for the purposes of exempting production from extraction taxes. Oil produced by stripper wells is exempt from extraction taxes. Stripper wells are defined as wells with an average daily production during a 12-month consecutive qualifying period of up to 10 barrels per day at a depth of less than 6,000 feet; up to 15 barrels per day at a depth of 6,000 to 10,000 feet; and up to 30 barrels per day at depths greater than 10,000 feet. Stripper wells must be certified by the NDIC. This

	section was amended in May 2004 to offer operators the opportunity to reclassify already determined single well stripper properties as another type of property.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
State	Oklahoma
Category	Tax Incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001.3a (2008)
Title	<i>Economically At-risk Oil or Gas Leases - Tax Exemptions</i>
Discussion	Economically At-Risk Oil Leases. Operators may apply to the Oklahoma Tax Commission for a rebate of 6/7ths of the gross production tax upon demonstrating that they operate a lease that is economically at-risk. This particular rebate was previously in effect for calendar years 1997 and 1998 wherein it applied only to at-risk oil leases. Effective July 1, 2005, Oklahoma statutes were amended wherein the rebate applies to both at-risk oil and gas leases. The definition of an economically at-risk lease means any lease operated at a net profit or a net loss, which is less than the gross production tax remitted for such lease in a given calendar year. Operators of at-risk leases shall make application to the Tax Commission to certify that they meet the criteria for being at-risk. Upon approval by the Commission, operators shall file a claim for refund of 6/7ths of the 7% gross production tax remitted for the qualifying year. The at-risk rebate is applicable to calendar years 1997, 1998, 2005, 2006 and 2007. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Texas
Category	Laws and Regulation
Citation	Tex. Nat. Res. Code Ann. § 32.067
Title	<i>Marginal Property Royalty Rates</i>
Discussion	The Texas School Land Board may grant a reduced royalty rate for a period of two years for marginally economic state leases. To qualify, the lease must produce an average of 15 barrels per day per well, or an average of 90 Mcf of gas per day per well. Once the reduced rate is granted, royalty rates will not increase for that lease for two years. Additional reductions can be applied for at the expiration of the two-year period. This tax reduction applies when oil prices average less than \$25 per barrel.
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.32.htm#32.067
State	Texas

Category	Laws and Regulation
Citation	Tex. Nat. Res. Code Ann. § 86.091
Title	<i>Marginal Gas Wells and Limits on Well Restrictions</i>
Discussion	The RRC can exempt marginal gas wells from otherwise applicable production limitations if the wells are located in gas fields without special field rules. A marginal gas well is defined in the Texas Natural Resources Code as a gas well incapable of producing more than 250,000 cubic feet of gas per day under normal operating conditions. Prior to this legislation, the RRC was precluded from exempting individual marginal wells that exist in fields with other wells capable of producing above marginal limits. This legislation replaced the RRC's requirement to limit production from gas wells producing more than 100,000 cubic feet of gas per day unless it is a marginal well in a field for which special field rules are not in effect.
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.86.htm#86.091
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 202.057
Title	<i>Incremental Production Incentive</i>
Discussion	Leases with wells that averaged seven BOE (barrels of oil equivalent) a day or less in 1996 are eligible for a fifty percent tax reduction on incremental production. The period from September 1, 1997 through December 31, 1998 will be used to determine any increase in production over the 1996 baseline level. The exemption is granted as long as the price of oil, as judged by the Comptroller, remains below \$25 (adjusted to 1997 dollars). It is suspended if the price reaches \$25 or above for three consecutive months and reinstated when it is below \$25 for three consecutive months.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.058
State	Utah
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(5)(a)
Title	<i>Marginal/Stripper Wells</i>
Discussion	Stripper wells are severance tax exempt unless the exemption prevents the severance tax from being treated as a deduction for federal tax purposes. Stripper wells are defined as wells that produce an average of less than 20 barrels per day for one year, or 60 Mcf or less of

	natural gas per day for 90 consecutive days.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102
State	West Virginia
Category	Legislation
Citation	HB 2749
Title	<i>Severance Tax Exemption</i>
Discussion	Imposes a tax equal to 5% of the gross value produced for the privilege of severing natural gas or oil. Effective taxable periods beginning on or after Jan. 1, 2000. An exemption from the severance tax is granted for natural gas provided free to surface owners. The exemption is granted to low-volume wells, producing less than 5 Mcf of natural gas per day or oil wells that produced an average of less than one-half barrel of oil per day during the calendar year immediately preceding a given taxable period. Natural gas or oil produced from a well that has not produced marketable quantities for five consecutive years immediately preceding the year in which the well is placed back into production and begins producing marketable quantities is also exempted for a maximum of 10 years.
URL	
State	West Virginia
Category	Tax incentive
Citation	WV Code Chapter 11, Article 13A-31
Title	<i>Severance Tax Exemption</i>
Discussion	The rule imposes a tax equal to 5% of the gross value produced for the privilege of severing natural gas or oil. Effective taxable periods begin on or after Jan. 1, 2000. An exemption from the severance tax is granted for natural gas provided free to surface owners. The exemption is granted to low-volume wells, producing less than 5 Mcf of natural gas per day or oil wells that produced an average of less than one-half barrel of oil per day during the calendar year immediately preceding a given taxable period. Natural gas or oil produced from a well that has not produced marketable quantities for five consecutive years immediately preceding the year in which the well is placed back into production and begins producing marketable quantities is also exempted for a maximum of 10 years.
URL	http://www.legis.state.wv.us/WVCODE/Code.cfm?chap=11&art=13A#13A

State	Wyoming
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	Marginal/Stripper Wells. Wells which produce an annual average of less than 15 barrels per day while the price of oil is less than \$20 per barrel are taxed at 4% (reduced from 6%). When the price of oil is \$20 or more, wells producing 10 barrels per day or less receive the 2% tax reduction.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2

“So we have a choice to make. We can remain one of the world's leading importers of foreign oil, or we can make the investments that would allow us to become the world's leading exporter of renewable energy. We can let climate change continue to go unchecked, or we can help stop it. We can let the jobs of tomorrow be created abroad, or we can create those jobs right here in America and lay the foundation for lasting prosperity.” – President Barack Obama, March 19, 2009

While there is no cure for U.S. dependence upon foreign sources to meet domestic energy demands, steps can be taken to help ensure U.S. energy security. One of the first, and most important, steps is ensuring the safety and vitality of the United States’ marginal wells. Technology is key to ensuring their economic vitality. In addition to technology, the tax incentives currently in place help to encourage domestic production and reduce our dependence upon foreign oil. By taking away tax incentives, the U.S. would “remain one the world’s leading importers of foreign oil.” (Obama, 2009)

The road to a “green future” goes through a “carbon present.” By discouraging domestic production, the likelihood of a successful “green” transition is severely diminished. Oil and gas are needed to supply the United States economy and to drive the United States to a sustainable future.

Marginal Well Case Study: Texas Supports Its Small and Independent Producers

The Railroad Commission of Texas (RRC) does not use the terms “small and independent producers.” However, based on the statistics for marginal wells, Texas has 46,234 domestic marginal gas wells out of a total of 95,814 and 132,297 stripper oil wells out of 155,822. Because of the preponderance of marginal wells, RRC estimates the significant majority of Texas producers could be considered “small”.

For purposes of tax incentives, Section 201.059 of the Texas Tax Code defines “Qualifying low-producing wells” as gas wells whose production during a 3-month period is no more than 90 mcf per day, excluding gas flared pursuant to the commission’s rules.

Under 16 TAC 3.79(15), Texas defines “marginal well” as any oil well which is incapable of producing its maximum capacity of oil except by pumping, gas lift, or other means of artificial lift, and which well so equipped is capable, under normal unrestricted operating conditions, of producing such daily quantities of oil as herein set out, as would be damaged, or result in a loss of production ultimately recoverable, or cause the premature abandonment of same, if its maximum daily production were artificially curtailed. Wells meeting the following descriptions are “marginal”:

(A) Any oil well incapable of producing its maximum daily capacity of oil except by pumping, gas lift, or other means of artificial lift, within this state and having a maximum daily capacity for production of 10 barrels or less, averaged over the preceding 10 consecutive days of stabilized production, producing from a depth of 2,000 feet or less.

(B) Any oil well incapable of producing its maximum daily capacity of oil except by pumping, gas lift, or other means of artificial lift, within this state and having a maximum daily capacity for production of 20 barrels or less, averaged over the preceding 10 consecutive days of stabilized production, producing from a horizon deeper than 2,000 feet and less in depth than 4,000 feet.

(C) Any oil well incapable of producing its maximum daily capacity of oil except by pumping, gas lift, or other means of artificial lift, within this state and having a maximum daily capacity for production of 25 barrels or less, averaged over the preceding 10 consecutive days of stabilized production, producing from a horizon deeper than 4,000 feet and less in depth than 6,000 feet.

(D) Any oil well incapable of producing its maximum daily capacity of oil except by pumping, gas lift, or other means of artificial lift, within this state and having a maximum daily capacity for production of 30 barrels or less, averaged over the preceding 10 consecutive days of stabilized production, producing from a horizon deeper than 6,000 feet and less in depth than 8,000 feet.

(E) Any oil well incapable of producing its maximum daily capacity of oil except by pumping, gas lift, or other means of artificial lift, within this state and having a maximum daily capacity for production of 35 barrels or less, averaged over the preceding 10 consecutive days of stabilized production, producing from a horizon deeper than 8,000 feet. (Reference Order Number 20-59,200, effective May 1, 1969.)

In Texas, most wells are drilled and produced by small, independent companies. The White House has proposed elimination of more than \$26 billion in tax breaks for oil and gas--half of that coming from eliminating a tax break for domestic oil and gas production. These incentives generally are for operators to pursue reserves. There are not as many incentives to increase or sustain production. Any change in existing incentives generally disproportionately impacts the small and independent operators more than the larger companies.

Crude oil and other petroleum products have been a major component of the Texas economy, in recent decades accounting for 10% to 25% of the Gross State Product. The combined oil and natural gas industry in 2006 employed 3.1% of the state's workforce and paid that workforce \$30.6 billion - 6.9% of all wages. (Texas Comptroller of Public Accounts, internal data with supplementary data from U.S. Bureau of Economic Analysis.)

Oil and natural gas production in Texas, although not as great as in the past, remains an important source of economic benefit, in terms of value, jobs created, and taxes. Historically, the oil and natural gas industry has accounted for approximately 10% to 25% of the state's GSP, a trend that roughly tracks the price of oil. In 2007, oil accounted for 15.7% of the GSP. According to the Texas Comptroller's input-output model of Texas' economy, the total economic value of oil and gas is 2.91 times the value of production. Additionally, 19.1 jobs are created per \$1 million of oil and gas production. Assuming oil and natural gas prices of \$25/bbl and \$5/Mcf, and year 2002 annual production of 366 MMbbl and 5.7 Tcf, wellhead value exceeds \$37 billion. Annual natural gas value is currently 3.1 times that of the oil wellhead value to Texas. In terms of economic value trickled down through the Texas economy and jobs created, this figure equates to nearly \$110 billion and 719,115 jobs. Severance, ad valorem, and indirect taxes provide additional economic benefits of more than \$6 billion to Texas. The leasing of mineral rights to state- and university-owned lands statewide, moreover, provides royalty and leasing revenue that replenishes the Permanent University and School Funds, important sources of revenue for public education in Texas.

In 2006, more than 312,000 Texans, or 3.1% of the state's work force, were employed in the oil and natural gas industry, which accounted for \$159.3 billion, or 14.9%, of Texas' GSP. For comparison, in 2003, the industry contributed \$85.6 billion to GSP, 10.3% of the state GSP. The Barnett Shale Trend, which has an estimated potential of at least 26 Tcf, resulted in creation of more than 100,000 jobs and more than \$10 billion annual output. (The Perryman Group, 2008)

According to the Texas Energy Plan 2005, (Texas Energy Planning Council, December 2004), a modest increase in exploratory drilling in Texas of 20% for a single year could generate new revenues to the state of \$60 million and these estimates are based on an assumed oil price of \$32.50 per barrel. The estimated net tax revenue effect at various percent increases in exploratory drilling is:

Percent Increase in Exploratory Drilling	10%	20%	30%
Net Annual Tax Revenue to State (millions)	\$9.0	\$37.5	\$66.1

The federal and Texas governments impose several major taxes on oil and gas production and consumption, in addition to receiving royalties, rentals, and bonuses from the leasing of federal- or state-owned mineral ownership. The federal and state gasoline taxes support transportation initiatives such as highway infrastructure and mass transit.

Texas imposes severance taxes on the value of oil and gas produced in the state, which has been a major and relatively stable source of revenue until the last two decades. State government received increased tax revenues from the petroleum industry during the boom. In 1983, 28% of all tax revenue came from oil and gas operations. With the inclusion of federal payments, income from oil and gas taxes, mineral lease and bonus, and oil and gas royalties still comprised 17.16% of the revenues of state government. Severance, ad valorem, and indirect taxes provide additional economic benefits of more than \$6 billion to Texas. Annual total marginal oil production tax revenue in 2006 was \$444,124,979 and annual total marginal gas production tax revenue was \$160,024,732. For purposes of tax incentives, Section 201.059 of the Texas Tax Code defines "qualifying low-producing well" as a gas well whose production during a 3-month period is no more than 90 mcf per day, excluding gas flared pursuant to the commission's rules.

Enhanced Efficiency Equipment: Texas Tax Code, Section 202.061, provides for a severance tax credit for enhanced efficiency equipment installed on marginal oil wells between September 1, 2005, and September 1, 2009. "Enhanced efficiency equipment" means equipment used in the production of oil that reduces the energy used to produce a barrel of fluid by 10% or more when compared to commonly available alternative equipment. The term does not include a motor or downhole pump. Equipment does not qualify as enhanced efficiency equipment unless a Texas institution of higher education approved by the comptroller and that has an accredited petroleum engineering program has evaluated the equipment and determined that the equipment does produce the required energy reduction.

Two-year Inactive Well Exemption: The program, extended by the Legislature in September 1999, remains a valuable opportunity for operators of inactive wells to return the wells to production with a 10-year severance tax exemption on crude oil, casinghead gas, and well gas produced by the reactivated wells. The filing deadline for this severance tax incentive program was extended to August 31, 2009. The Railroad Commission can certify wells for the program through February 28, 2010. Any gas well or oil well with no more than one month of production in the two-year period prior to application to the commission for certification can be eligible. The commission designates monthly oil and gas wells that meet the above criteria. Operators are notified by letter of their initial eligibility for the exemption. Eligible wells are also identified on the Oil and Gas Schedule listed by operator with a single asterisk. As of November 13, 2000, more than 95,000 wells had been designated. If a designated well was returned to production prior to August 31, 2009, and the operator files a W-10/G-10 retest or a W-2 retest, the commission will send a letter to the operator. By signing the bottom of that letter and returning it to the commission, an operator is applying for certification in the program. Upon approval, a certification letter will be issued to the operator. This certification, along with Comptroller Form AP-158, is then filed with the Comptroller of Public Accounts to receive the tax exemption. Certified wells are identified on the schedule with double asterisks.

Three-year Inactive Well Exemption: Although the commission issued its last certifications under this incentive February 29, 1996, (the statutory deadline), wells that were certified qualify for a severance tax exemption on oil, gas well gas, and casinghead gas produced in the 10-year period following certification. Certified wells are identified on the monthly stripout of allowables sent to oil and gas operators.

The Incremental Production Incentive. Leases with wells that averaged seven BOE (barrels of oil equivalent) a day or less in 1996 are eligible for a 50% tax reduction on incremental production. The period from September 1, 1997, through December 31, 1998, will be used to determine any increase in production over the 1996 baseline level. The exemption is granted as long as the price of oil, as judged by the comptroller, remains below \$25 (adjusted to 1997 dollars). It is suspended if the price reaches \$25 or above for three consecutive months and reinstated when it is below \$25 for three consecutive months.

The Incentive to Market Previously Flared or Vented Casinghead Gas. If an operator markets casinghead gas that had previously been released into the air (vented or flared) for 12 months or more in compliance with commission rules and regulations, the operator may receive a severance tax exemption on that gas for the life of the well. Operators will apply to the Railroad Commission for certification.

Exemption for Gas from Reactivated Orphaned Wells. An exemption is allowed for gas and casinghead gas from a well certified as an "orphaned well" by the Texas Railroad Commission. An orphaned well is defined in Section 89.047(a)(3) of the Natural Resources Code as one that has a commission permit, has not reported production for the preceding 12 months, and whose current operator's commission-approved organization report has lapsed. When a certified orphaned well is put back into production by a certified operator, the well will be eligible for a 100% exemption from natural gas production tax and the oilfield cleanup fee for as long as the certified operator operates the well.

The Enhanced Oil Recovery (EOR) Incentive. Oil produced from an approved new EOR project or expansion of an existing project is eligible for a special EOR tax rate of 2.3% of the market value (one-half of the standard rate) for 10 years after commission certification of production response. For the expansion of an existing project the reduced rate is applied to the incremental increase in production after response certification.

The High-Cost Gas Incentive. Gas from wells defined as high-cost gas wells under Section 107 of the old Federal Natural Gas Policy Act (NGPA) is eligible for a severance tax reduction under this incentive. The level of reduction is based upon drilling and completion costs (this part is administered by the Office of Comptroller of Public Accounts). To qualify for the reduction the well must have been spudded or completed from September 1, 1996, through August 31, 2002. An earlier program granted a tax *exemption* if the well was spudded or completed between May 24, 1989, and September 1, 1996. The

commission provides certification that the well is a high-cost gas well; that is, it produces gas from (a) a gas well completion below 15,000 feet deep, (b) a designated tight formation, (c) Devonian shale, (d) coal seams, or (e) geo-pressured brine.

Chapter 7. Orphaned and Abandoned Wells

Orphaned wells are defined by most states as inactive with no responsible party to plug the well and restore the location. Historically, many of these wells are pre-regulatory. States now have stringent regulations in place to prevent their occurrence.

IOGCC has been a leader in the study of orphaned wells, their costs, and the regulations associated with their management. The responsibility for monitoring and plugging orphaned wells falls to the states. Although many states have established plugging funds, plugging is an extreme financial burden. IOGCC member states continue efforts to explore innovative and financial means to plug orphaned wells.

[Section 349 of the Energy Policy Act of 2005](#) provides for the establishment of a program to provide technical and financial assistance to oil and gas producing states to facilitate remediation of environmental problems caused by orphaned or abandoned oil and gas exploration or production well sites on state or private land.

The Act endorses the Secretary of Energy to work with the states, through the IOGCC, toward development of a program that quantifies and mitigates environmental risks associated with onshore sites. It includes mechanisms to facilitate (a) identification of persons currently providing a bond or other form of financial assurance for an oil or gas well that is orphaned or abandoned; (b) criteria for ranking orphaned or abandoned well sites; (c) information and training on best practices for remediation of different types of sites; and (d) funding of state mitigation efforts on a cost-shared basis. The Act authorizes \$25 million per year for fiscal years 2006 through 2010 to be appropriated to carry out these activities and the Federal Reimbursement for Orphaned Well Reclamation Pilot Program.

In October 2006, the IOGCC passed resolution 06.115 requesting funding for reclamation of orphaned well sites. Resolution 08.115, its re-authorization, was approved on November 18, 2008. The resolution supports congressional actions that facilitate the plugging reclamation of orphaned and abandoned well sites and urges Congress to provide necessary funds for the reclamation of orphaned well sites. Key highlights [of resolution 08.115](#):

The plugging of the nation's orphaned wells is a large financial burden on the states, which have excellent programs to address the problem, and there is currently no federal financial support.

The IOGCC supports congressional actions that facilitate the plugging reclamation of orphaned and abandoned well sites and urges Congress to provide necessary funds for the reclamation of orphaned well sites.

Plugging and Abandonment

The earliest wells often were abandoned unplugged or plugged with whatever material was available: tree stumps, logs, mud or other objects. Wells drilled prior to 1930 usually lacked cement plugs. California was the first to require such plugs. (Interstate Oil and Gas Compact Commission, 2008) Texas passed a law in 1899 requiring operators to case off oil and gas wells, plug abandoned wells, and make it illegal to let the gas from oil wells, which was then considered a waste stream, escape into the atmosphere (Hazardous Business - The Oil Wars - Page 1 - Texas State Library). Proper plugging prevents migration of fluid between formations. States dictate the procedure for plugging and often require a field inspector to be present to assure that the plugs are placed properly.

New cementing technologies help keep fluids from migrating between zones. One innovative cement repairs itself. In the presence of hydrocarbons, “self-healing” cement will swell and seal fractures. Sealing wells effectively is an important step in safeguarding aquifers.

Oklahoma researchers proved in 2004 that they could take a waste product, Class C fly ash from coal-fired power plants, and turn it into an environmentally safe plugging material for abandoned wells. According to the EPA-funded study, Class C fly ash has properties similar to cement, contains toxic trace elements far below the limits of EPA’s Toxicity Characteristic Leaching Procedure, and can be pumped into wells using low-impact coiled tubing. (Shah, 2004) At the time of the report, only one-half of the fly ash produced from coal-fired plants in Oklahoma was being reused. The remainder was sent to landfills. In addition to the environmental benefits of recycling the fly ash and using it to plug wells with lightweight rigs and tubing that reduces surface impacts, the product is inexpensive. The fact that it is affordable makes reusing fly ash an attractive alternative to traditional cementing materials for states that are working to clean up well sites.

In addition to a lack of knowledge and regulatory oversight in the early years, the oil and gas industry has gone through a number of boom and bust cycles over the last 50 years. The result was large numbers of wells abandoned by bankrupt oil producers. State regulators were forced to implement strict laws on plugging so that taxpayers were not left holding the bag. Today, some states are looking at

revising their plugging requirements to take into account new technologies that are being used to protect the environment and to recover oil from wells that formerly were not economically feasible.

According to an operator in Tennessee, "Thirty years ago, if a well didn't flow oil when it was drilled in, it was considered a dry hole. Fifty years ago, all too often dry holes were not plugged and were just open. Thus, the regulations require either producing or plugging all wells. With today's technology, we can turn many old wells that appear to be dry into substantial oil or gas producers. But if the state forces old wells to be plugged, they can seldom, if ever, be reopened." (Outdated Regulations Slow Oil, Gas Drilling In Tennessee - Business News - redOrbit).

Site Restoration and Remediation

A producer's responsibility to reduce environmental impacts does not end with drilling and production, or even plugging the well. The company must restore the site, and if necessary, perform soil and water remediation. Interim activities that mitigate impact from erosion and potential spills, including building earthen berms and re-seeding, may be used to reduce time and costs of site closure. A producing well requires equipment such as pump jacks, tanks, and other equipment, but debris and other materials should be removed from the site and the surrounding areas restored as close as possible to original condition.

Texas established the Oilfield Cleanup Fund in 1991 to plug abandoned and orphaned wells and to clean up abandoned sites. Since its inception, more than 25,000 abandoned wells have been plugged and more than 4,000 clean-up activities have been conducted.

Most well sites require only debris removal, some dirt work, and re-vegetation. In the case of spills, leaks, or other adverse events, contaminated water and soils may need remediation, a process that takes weeks, months, or even years depending on the techniques used.

Research and development into site remediation is expanding, in part because of new knowledge and increased awareness of dangers associated with many substances that were once considered harmless. Numerous industries contribute to current, ongoing, or historical pollution problems. Water and soil contamination is associated with manufacturing pharmaceuticals, cosmetics, plastics, paper, and glass, among others. Agricultural sites may be contaminated with fertilizers, herbicides, and pesticides. Dry-cleaning facilities, munitions plants, and nuclear test sites are other sources of contaminants.

Of the site remediation technologies garnering attention and research, the most promising include some very low-tech solutions. Interest in bioremediation, which uses living things to remove pollutants, is growing as researchers show that plants, bacteria, and earthworms are among the most effective, environmentally friendly site remediation tools available.

Remediation technologies are chosen based on the type of contaminant, the level of risk the contamination presents --- a higher level of risk may demand a more aggressive, more invasive, or faster clean-up process --- costs, the area of land or water affected and other site-specific factors. Contaminant removal technologies exist for both surface and in-situ (sub-surface) use and for a wide variety of pollutants from salts, to heavy metals, to radioactive materials. Remediation often includes a combination of treatments and, depending on the circumstances, might include an initial aggressive phase using barrier technologies, chemicals, and surface and subsurface disturbance followed by a longer, less aggressive bioremediation phase to complete the process.

Brine impacted soils are the most common adverse impact associated with onshore oil and gas development, followed by hydrocarbon contamination from spills and leaks. Most oil- and gas-bearing formations contain large volumes of highly saline water, which is produced along with the hydrocarbons. If this water migrates to other formations due to improper well casing, groundwater can be contaminated, and if the water leaks or is spilled at the surface, soils and water bodies, such as ponds and streams, can be damaged. Hydrocarbon contamination to soils and water occurs in much the same way.

Potential surface and water damage can be avoided or minimized if a leak or spill is stopped and quickly contained. Where a minimal amount of surface has been affected, the soil may be tilled or removed and spread over a larger surface area. Land-spreading, which is a single application, and land-farming, which involves repeated applications, are commonly used to dispose of drilling wastes and drilling site soils. In some areas of the country land-spreading is desired by landowners because the mostly organic material is believed to improve soil structure and crop production. Inorganic compounds and heavy metals become diluted and metabolized by the soil when periodic tilling, water, nutrients, and other amendments, such as calcium, are used.

Phil Spurlin, of Beacon Environmental, a specialized remediation team that works with the Oklahoma Energy Resources Board (OERB) to clean up orphaned and abandoned well sites, notes, "Some counties (in Oklahoma) will accept hydrocarbon soils to use for road bases. Some use sandier

soils that are salt-impacted for icy road conditions.” Other states allow similar waste disposal methods. Pennsylvania used funds from a Clean Water Act grant to determine the potential for water damage or other adverse impacts due to leaching, and used the information to develop guidelines for safe road-spreading of brine impacted soils and drill cuttings.

In-situ oxidation involves injecting oxidants, such as ozone, to accelerate degradation. Air “sparging” is an in-situ remediation technique that involves injecting contaminant-free air into the contaminated soil or water to remove volatile organic compounds (VOCs). The hydrocarbons are vaporized and removed through soil vapor extraction (SVE) equipment that uses a nearby well to vent or vacuum the VOCs from the contaminated zone. Thermal heating equipment is an alternative method of vaporizing contaminants that are then vacuumed to the surface and disposed.

Phytoremediation refers to a bioremediation technology that uses plants to remove, transfer, stabilize, or destroy contaminants in soil or water. Early studies show that phytoremediation can address such diversified contaminants as chlorinated solvents, metals, pesticides, radionuclides, and hydrocarbons. Researchers have identified certain plants, called metal hyperaccumulators, which are very good at removing heavy metals from soils. ("Green Technology" Helps Clean Up Toxic Soils / June 19, 2000/ News from the USDA Agricultural Research Service) The metals accumulate in the leaves and stems of the plants, which can then be harvested. Understanding the mechanisms behind certain plants' ability to tolerate, or remove, toxins from soil also may be the key to growing food on unproductive land and lead to genetically engineered plants for mineral extraction, called phyto-mining. One of the greatest benefits of phytoremediation is that growing and harvesting plants is less labor intense, invasive, and costly than some other remediation methods.

Researchers are especially interested in developing plants and bacteria that can flourish in specific environments and hope to find ways to accelerate the organic processes that remove toxins. Algae, which grow prolifically under the right conditions, are bioremediation agents that remove carbon dioxide (CO₂), and interestingly, may be grown in brackish produced water from oil and gas wells, or other wastewater, and then used as a feedstock for biofuels.

Earthworms are good for more than fish bait. Gardeners love them because worms aerate and fertilize the soil. And according to researchers, “Earthworms have also been shown to retard the binding of organic contaminants to soils, release previously soil-bound contaminants for subsequent

degradation, and promote and disperse organic contaminant degrading microorganisms.” (Earthworm assisted bioremediation of organic contaminants)

In addition to remediation technologies, researchers continue to develop faster and more accurate tools to identify the nature and extent of various types of pollution and to predict the behavior of contaminants as they move through the air, ground, or water. Prompt and proper identification of a contaminant and understanding the risk to surrounding areas allows selection of the most effective remediation solution.

Louisiana’s Oilfield Site Restoration Law

404 of the 1993 Regular Session established the Oilfield Site Restoration (OSR) Law that includes an orphaned well plugging and site restoration fund. Fund oversight is provided by an OSR Commission. Revenue for the fund is generated from a fee on oil and gas production in the state, which is paid quarterly by Louisiana oil and gas operators. The imposed fee on production is in the amount of \$.015 per barrel of oil and condensate and \$.003 per Mcf of gas. Additionally, in accordance with the provisions of the OSR Law, when a transfer of ownership interest of an oilfield site occurs, either party of the transfer can elect to file an application to establish a site-specific trust account (SSTA) to cover future restoration costs. Doing this relieves the fee-generated portion of the fund from the financial burden of paying for restoration at the site covered by the SSTA in the event the site is orphaned. SSTA funds are not for general program use and are earmarked specifically to be used to restore the site to which they are dedicated. Once established, site-specific trust accounts remain with the site through subsequent property transfers.

The IOGCC Orphaned Well Task Force, comprised of representatives from member states, was formed to address the requirements related to section 349 of the Energy Policy Act of 2005. Section 349 provides for the establishment of a program to provide technical and financial assistance to oil and gas producing states to facilitate remediation of environmental problems caused by orphaned or abandoned oil and gas exploration or production well sites on state or private land.

The Act directs the Secretary of Energy to work with the states, through the IOGCC, to develop a program that quantifies and mitigates environmental risks associated with onshore wells that includes mechanisms to facilitate:

- (a) identification of persons currently providing a bond or other form of financial assurance for an oil or gas well that is orphaned or abandoned.
- (b) criteria for ranking orphaned or abandoned well sites.
- (c) information and training on best practices for remediation of different types of sites.
- (d) funding of state mitigation efforts on a cost-shared basis.

The Act authorizes \$25 million per year for fiscal years 2006 through 2010 to be appropriated to carry out these activities and the Federal Reimbursement for Orphaned Well Reclamation Pilot Program.

In response to the Act, the IOGCC developed the framework for the program as part of a [cooperative agreement](#) with the DOE. The Task Force developed an [Appropriated Fund Disbursement Model](#) and a [Model Prioritization Schedule](#). Although the funding authorized in the act has yet to be appropriated, the IOGCC and its Orphaned Well Task Force continue to urge Congress to provide necessary funds for the reclamation of orphaned well sites.

The IOGCC framework is prepared as part of a cooperative agreement with the DOE NETL. The agreement includes the development of model matching award criteria, guidelines, program explanations, accountability and reporting requirements, and forms.

States Keep “Plugging Away” at Orphaned Wells

States continue to address orphaned well and site restoration issues head-on, albeit at a much slower pace than anticipated after the Energy Policy Act of 2005. IOGCC member and associate member states mitigate future potential orphaned and abandoned wells through permitting and regulatory processes. Most states require some form of security or financial assurance in the permitting process to

ensure proper plugging and abandonment of oil and gas wells in the event the operator becomes insolvent. Additionally, individual states address potential abandonment of wells through temporary abandonment allowances, plugging and abandonment requirements, and incentives for bringing idle and orphaned wells back into production. Individual state programs are highlighted below.

Sometimes it takes a fresh pair of eyes looking at a situation to spot problems. When a new commissioner was seated at the Alaska Oil and Gas Conservation Commission (AOGCC) in 2005, the commission identified an opportunity to conserve oil and gas reserves that previously had been overlooked. The commission was issuing permits for new directional wells to be drilled off existing wells before making sure the operator had achieved maximum recovery from the original well. Moving into an untapped formation is attractive to operators because the initial recovery rate can be much higher than that from an established well, but it is not necessarily good stewardship of a finite resource. In May of 2005, the AOGCC began requiring operators to demonstrate that maximum possible recovery had been achieved from a well before allowing the productive zone to be plugged for a directional re-drill into a new reserve. Although some of the operators initially questioned the new procedure, proving thorough recovery has now become a routine part of the permitting process for directional re-drills.

Michigan has been careful to balance the need to preserve marginal wells for their production potential against the interest in preventing wells from becoming orphaned and thus transferring liability to the state for plugging or remediation. Under Michigan regulations, if a well is not used for its intended purpose for 12 months it must be plugged, unless the well owner receives approval to “temporarily abandon” the well.

Michigan issued an order in 2004 to provide for consistent standards for such approvals. Under the order, a well may be approved for temporary abandonment if the owner shows it has a legitimate potential future use or is awaiting a market connection, and is subject to a continuing lease or other agreement allowing access. Not more than 10 percent of a permit holder’s wells can be held temporarily abandoned at any time. If a well does not meet these criteria, it may qualify for an exception based on good cause (in particular, a demonstration that it is not likely to become an orphaned well) and subject to additional bonding requirements if needed. Storage tanks must be drained and the well site and safety measures must be maintained.

In July 2008, the California Division of Oil, Gas, and Geothermal Resources (DOGGR) doubled its orphaned well plugging fund from \$1 million to \$2 million annually for a period of four years. After four

years, the plugging fund will revert to \$1 million. The increase was to eliminate the existing high-priority orphaned well inventory and the hazards that these wells present. The wells are a liability, potentially dangerous, and need to be plugged as soon as possible. The size of the project and the impact that the project would have on DOGGR's workload dictated that the project be done over four years. At the time, the orphaned well inventory stood at 396 wells, of which 209 were considered high-priority wells. The cost to plug was calculated at about \$8 million, with each well averaging just over \$38,000. Some oilfield facility cleanup costs were included in the \$8 million total. During the first year of plugging under the increased amount, DOGGR plugged 43 wells at a cost of \$1.943 million. DOGGR is funded by an assessment on the oil and gas produced in the state. The current assessment rate is 8.8 cents per barrel of oil and 10 Mcf of gas produced. DOGGR's annual plugging plans and expenditures are monitored by the Orphan/Idle Well Committee (under the umbrella of the Conservation Committee of California Oil and Gas Producers, an industry sponsored organization). Since the orphaned well plugging program began in California in 1977, DOGGR has plugged 1,207 orphaned wells at a cost of more than \$21 million. For more information about California's orphaned well programs reference the case study at the end of this chapter.

Recent Kansas Corporation Commission cases narrowly defined responsible parties for orphaned and abandoned wells

The Oklahoma Energy Resources Board (OERB) was established for energy education and the remediation of abandoned oilfield sites. The OERB conducts educational programs for children, and spends at least half of its funding on oilfield cleanup projects. The OERB also studies remediation technology using DOE funds.

On June 30, 2009, RRC Commissioners announced that plugging activities for Texas' abandoned oil and gas wells reached a milestone with the plugging of the 30,000th abandoned well. Since 1984, the RRC has been plugging wells for which there is no responsible operator.

In 1991, the Legislature created the Oilfield Cleanup Fund, which increased the financial ability of the state's oil and gas regulator—the Railroad Commission—to plug more abandoned oil and gas wells and also to clean up abandoned oil and gas well sites. Texas oil and gas operators' permitting and production fees go into the Oilfield Cleanup Fund, which finances the plugging and cleanup of abandoned wells and sites.

The RRC periodically lists all orphaned wells on its website. The wells are available for adoption by a new operator. Operators are required to file a Form P-4 (Producer's Transportation Authority and Certificate of Compliance) and a copy of a mineral lease or document that shows that they have the right to operate the lease. The only trend that has emerged is that well adoption appears to be influenced by the fluctuating prices of crude oil and natural gas. During high prices, operators tend to adopt more wells. As prices decrease, fewer wells are adopted.

Since 1997, according to the Wyoming Oil and Gas Conservation Commission, its field staff has plugged 273 orphaned wells across the state, at a total cost of \$5.38 million. Bonds from operators responsible for those wells covered slightly more than \$1 million of that cost.

Concerned that a severe downturn in the CBM industry could lead to bankruptcies -- possibly even orphaned wells -- state officials are reviewing bonds meant to cover the cost of plugging wells.

"In the past, the state had insufficient bonding to plug the potential number of orphaned wells," commission supervisor Tom Doll said.

However, last year, the commission raised its bonding requirement from \$3 per foot of well depth to \$10 per foot, based on the fact that the average cost was actually about \$7 per foot to plug a well.

Companies are being asked to report to the agency their number of idle wells along with plans for producing, maintaining, or plugging. Doll said the process will help the agency determine whether each company has sufficient bonding.

Wyoming has implemented a strategy to increase communications with operators regarding idle wells. One of the lessons learned from the increase in idle well bonds relates to communication between regulators and operators. To that end, the commission staff selected 100 operators to contact in 2009 to discuss idle well plans. Staff sorts the OGCC database for idle wells and provides a letter to the operator with the listing detailing a first pass at the idle well bond requirement based on total well depth summed for all wells listed. The current \$10 per foot bond amount is applied to that total sum. The operator is invited to meet informally with staff, and the State Oil and Gas supervisor attends as many of the meetings as practical. During the meeting, the operator provides an edited listing with revised bonding requirements reflecting those wells planned to be returned to production, those to be plugged, abandoned and reclaimed, and a timeline for both. The remaining wells are bonded. If the operator provides supporting documentation of actual plugging and abandonment costs or bids, \$10 per

foot cost might be negotiated down to the bid or actual pricing history at the discretion of the supervisor. The final idle well bond amount is agreed upon taking into account existing individual or blanket bonds in place. Another idle well meeting is scheduled for one year from the date of the initial meeting. In some cases, more frequent updates from the operator might be requested. Staff provides a letter detailing what was agreed upon to formalize the process. The idle well meeting improves the operator's understanding of the bond fee and provides a forum to communicate plans to return wells to production or set a plugging and reclamation schedule as well as to get the proper bonding in place.

In 2008, 33 IOGCC member states reported plugging 2,942 wells at an average cost of \$11,398 per well. \$33,532,967 was expended to plug orphaned wells and 56,260 wells were wait-listed by state regulatory agencies.

Table 26. 2008 Orphaned Well Statistics

STATE	Orphan Wells Plugged	Plug funds expended	Wait Listed	Undocumented / unidentified orphan wells
ALABAMA	0	0	3	0
ALASKA	0	0	9	0
ARIZONA	0	0	0	0
ARKANSAS	36	382,000	644	550
CALIFORNIA	53	2,345,427	292	967
COLORADO				
FLORIDA	0	0	17	150
GEORGIA				
IDAHO	0	0	0	0
ILLINOIS	3	112,240	3,825	0
INDIANA	84	462,760	785	2,500
KANSAS	525	2,519,351	6,788	20,000 - 40,000
KENTUCKY	105	294,746	12,660	2,000
LOUISIANA	173	4,524,380	2,712	No info available
MARYLAND	0	0	0	0
MICHIGAN	16	733,543	71	50
MISSOURI	0	0	2,000	0
MISSISSIPPI	0	0	0	0
MONTANA	13	105,936	56	300
NEBRASKA	0	0	6	6

NEVADA	0	0	0	0
NEW MEXICO ³⁰	30	1,454,282	190	0
NEW YORK	94	1,884,000 ³¹	4,717	40,000
NORTH CAROLINA				
NORTH DAKOTA	0	0	5	0
OHIO	23	281,030	495	9,000
OKLAHOMA	292	1,650,249	1,740	10,000
OREGON				
PENNSYLVANIA	236	1,492,654	8,827	100,000+
SOUTH CAROLINA	0	0	0	0
SOUTH DAKOTA	0	0	0	0
TENNESSEE	0	0	53	4000
TEXAS	1,337	14,666,175	8,846	N/A
UTAH	0	0	27	8
VIRGINIA	0	0	37	70
WASHINGTON				
WEST VIRGINIA	8	400,000	1,400	3,974
WYOMING	20	617,926	135	<5

Table 27. Orphaned and Abandoned Wells Laws, Regulations and Incentives

State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil and Gas Commission General Rules and Regulations § G-1, G-2, G3
Title	<i>Abandoned, Orphan or Leaking Wells</i>
Discussion	The amendment defines abandoned wells as those not having produced for 2 years, those without payment of annual well fees, wells not plugged in accordance with order, etc. The director may bring application to the Commission to request abandonment determination. The operator must repay any funds expended by the Commission Well site equipment, including any hydrocarbons, may be disposed to offset plugging costs. The bill also provides administrative procedures to request transfer of abandoned or orphaned wells to another operator, as opposed to AOGC plugging; to acquire a signed, properly recorded lease; and to pay salvage value for any equipment at the well. The director has discretion to approve or deny any transfer requests. Decisions may be appealed to the Commission (\$250 fee – A-3).prior to issuance of any further drilling permits, and additional bonding may be required. The bill defines orphaned wells as those where the permit holder can't

³⁰ Fiscal year 07/2007 through 06/2008

³¹ Includes approximately \$1.8 million spent by EPA to plug abandoned leaking oil wells (OPA 90 funds)

	be located; those where the well isn't covered by a bond from the last operator; and those where annual well fees have never been paid. If a well satisfies the criteria, the director administratively determines the well to be orphaned, which authorizes expenditures of funds to plug the well.
URL	
State	California
Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3204
Title	<i>Individual Bond</i>
Discussion	See Cal. Pub. Res Code § 3206
URL	
State	California
Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3205
Title	<i>Blanket Bond</i>
Discussion	See Cal. Pub. Res Code § 3206
URL	
State	California
Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3205.5
Title	<i>Cash Bonds</i>
Discussion	See Cal. Pub. Res Code § 3206
URL	
State	California
Category	Laws and Regulation

Citation	Cal. Pub. Res Code § 3206
Title	<i>Long-term Idle Well Bonds/Fees</i>
Discussion	In response to the growing number of idle and orphaned wells, bonding levels for active and long-term idle wells and idle well fees were increased to provide more financial assurance and more funding to plug existing orphaned wells.
URL	
State	California
Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3238
Title	<i>Charges for Certain Wells</i>
Discussion	California provides a 10-year abeyance of the assessment on oil and gas produced from orphaned wells and wells that have been idle for five or more years when they are returned to productive status. Furthermore, the State Oil and Gas Supervisor may permit an operator to evaluate the economic viability of an orphaned well for 90 days without having to provide bond coverage or assume plugging responsibility for the "adopted" orphaned well.
URL	
State	California
Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3258
Title	<i>Division Expenditures</i>
Discussion	The orphaned well plugging fund is doubled from \$1 million annually to \$2 million annually for a period of four years.
URL	
State	Illinois
Category	Tax incentive
Citation	Illinois Public Act 094-1085

Title	<i>Crude Oil Marketing and Education Act</i>
Discussion	This voluntary program is modeled after the Oklahoma Energy Resources Board. A tax of 1/10th of 1% of gross revenue of crude oil sales is collected into a fund. One-half of the fund is dedicated to abandoned oilfield site cleanup and the other half funds energy education in public schools.
URL	http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1392&ChapAct=225 ILCS 728/&ChapterID=24&ChapterName=PROFESSIONS AND OCCUPATIONS&ActName=Illinois Petroleum
State	Louisiana
Category	Laws and Regulation
Citation	La. Rev. Stat. Ann. § 30:80
Title	<i>Louisiana Oilfield Site Restoration Law</i>
Discussion	Act 404 of the 1993 Regular Session established the Oilfield Site Restoration (OSR) Law that includes an orphaned well plugging and site restoration fund. Fund oversight is provided by an OSR Commission. Revenue for the fund is generated from a fee on oil and gas production in the state, which is paid quarterly by Louisiana oil and gas operators. The imposed fee on production is in the amount of \$.015 per barrel of oil and condensate and \$.003 per Mcf of gas. Additionally, in accordance with the provisions of the OSR Law, when a transfer of ownership interest of an oilfield site occurs, either party of the transfer can elect to file an application to establish a site-specific trust account (SSTA) to cover future restoration costs. Doing this relieves the fee-generated portion of the fund from the financial burden of paying for restoration at the site covered by the SSTA in the event the site is orphaned. SSTA funds are not for general program use and are earmarked specifically to be used to restore the site to which they are dedicated. Once established, site-specific trust accounts remain with the site through subsequent property transfers.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=87691
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann. § 1509.071
Title	<i>Forfeiture of bond; oil and gas well fund; proceedings for forfeiture of appurtenant equipment to state; landowner may apply to plug well; transfer of ownership</i>

Discussion	A landowner grant program has been established for the plugging of orphaned wells. Between \$300,000 and \$500,000 per year will be set aside to fund this program. Eligible landowners can plug the orphaned wells on their land sooner and have more control in the plugging process than in the state's traditional bid process. The landowners must receive bids from contractors for a plugging plan that complies with state regulations and must submit an application to the Division of Mineral Resources Management. If approved, the landowner will be reimbursed for the cost of plugging.
URL	http://codes.ohio.gov/orc/1509.071
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann. § 1509.071
Title	<i>Forfeiting Bond</i>
Discussion	This law permits the Division of Mineral Resources Management to transfer to landowners or their agents for production, a well eligible for plugging under this program if Ohio's well ownership requirements are met. Wells previously abandoned will become property of the state. Landowners or registered well owners can take over the well for production.
URL	http://codes.ohio.gov/orc/1509.071
State	Oklahoma
Category	Resource
Citation	
Title	<i>Brownfields Restoration Program</i>
Discussion	The Oklahoma Corporation Commission has a Brownfields program to help people and companies deal with these old, potentially polluted sites. The state provides information and guidance, some free services, and helps them access various programs. At the end of the process, the new owner/operator can be granted a state and federal liability release. The program can: (1) Determine eligibility; (2) Conduct some limited assessment work at a potentially polluted oil/gas site, at no cost to the eligible owner/operator, to determine if the property is likely polluted or not; (3) Provide complete no-cost assessments and sometimes a portion of the cleanup costs if a government, church, or non-profit is seeking to buy or use the property; (4) Refer an abandoned polluted and/or junk-filled oilfield site to the OERB for a fully funded (no cost) cleanup; (5) Help owners/operators access the state plugging fund for abandoned oil and gas wells found on the property, at no cost; (6) Help prospective purchasers access the Commission's Petroleum Storage Tank Indemnity Fund, which after a small deductible (often waived for cities and non-profits) will pay to

	assess and clean up the property at no additional cost; (7) Refer owners to the Commission group that can investigate the source of unknown gas fumes in buildings, and help with curing the problem; and (8) Keep eligible site owners/operators informed about periodic federal Brownfields grants, up to \$200,000 per site to pay for additional assessment work and to clean up the property, that can be applied for. Sites that go through the Brownfields program have a State and Federal liability release.
URL	
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. tit. 68, § 1001(F)
Title	<i>Property Exempt from Taxation</i>
Discussion	The statute exempts wells on which work to re-establish production commenced on or after July 1, 1994, and on or before June 30, 1997, that have not produced oil, natural gas, or oil and natural gas for a period of not less than two years, as evidenced by the appropriate forms on file with the Oklahoma Corporation Commission reflecting the well's status. Also exempt are wells on which work to re-establish production commenced on or after July 1, 1997, and on or before June 30, 2009, that have not produced oil, natural gas, or oil and natural gas for a period of not less than one year, as evidenced by the appropriate forms on file with the Oklahoma Corporation Commission reflecting the well's status. Exemption is also granted to any well which, after July 1, 1997, experiences mechanical failure or loss of mechanical integrity, as defined by the Corporation Commission, including but not limited to, casing leaks, collapse of casing, loss of equipment in a wellbore or any similar event which causes cessation of production and results in a workover of the well, as evidenced by the use of a workover rig or other mechanical device being placed over the well to repair the well or equipment. Qualified wells are exempt for a period of 28 months from the date production was re-established. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf#http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Pennsylvania
Category	
Citation	71 Pa. Stat. Ann. § 1934-A
Title	
Discussion	Grandfathering Pre-Act Wells from Bonding. Bonding is not required for any well drilled prior to April 18, 1985, the date of the Oil and Gas Act, or for on-site disposal of residual

	waste at these well sites.
URL	
State	Pennsylvania
Category	Laws and Regulation
Citation	Pa. Laws 223, Chapter 6, § 601(c)
Title	<i>Well Plugging Funds</i>
Discussion	Orphan Wells. Permit fees are waived for producers who recondition an orphaned well from the Department of Environmental Protection's plugging inventory and return it to production.
URL	http://www.dep.state.pa.us/dep/deputate/minres/oilgas/act223ch4_6.htm#Sec_601
State	Texas
Category	Laws and Regulation
Citation	HB 2161
Title	<i>AN ACT relating to the power of the Railroad Commission of Texas to adopt and enforce safety standards and practices applicable to the transportation by pipeline of certain substances and to certain pipeline facilities, the provision of severance tax credits and exemptions and other incentives and procedures for producing oil or gas from certain wells or plugging wells, and the procedure for computing severance taxes in connection with certain gas sales; imposing an administrative penalty.</i>
Discussion	See Texas Natural Resources Code § 89.047; adopted by 79th Legislature
URL	http://www.capitol.state.tx.us/tlodocs/79R/billtext/pdf/HB02161F.pdf
State	Texas
Category	Laws and Regulation
Citation	Tex. Nat. Res. Code Ann. § 89.047
Title	<i>Orphaned Well Reduction Program</i>
Discussion	An orphaned well under this program is defined as a well that has been inactive for 12 months where the operator of the well no longer has a current registration with the Railroad Commission as required by Texas statute. Under the program, a prospective new operator may nominate the well and be given a 30-day period during which he can

	(through visual means and non-invasive testing methods) inspect the well to determine whether the person wishes to assume operatorship of the well. If so, the operator provides evidence of a good-faith claim to the right to produce minerals from the well, files paperwork with the Commission to assume operatorship of the well, and remits a \$250 fee. If an orphaned well is taken over by a new operator under this program during the effective period (i.e., January 1, 2006, to December 31, 2007), the operator is entitled to receive: (1) a non-transferable exemption from severance taxes for all future production from a well under Tax Code §202.060; (2) a non-transferable exemption from the fees provided by Natural Resources Code §§81.116 and 81.117 (oil and gas regulatory fees paid into the Oilfield Cleanup Fund based on production) for all future production from the well; and (3) a payment from the Commission in an amount equal to the depth of the well times \$0.50/foot if, not later than the third anniversary of the date the operator acquires the well, the operator brings the well back into continuous active operation or plugs the well in accordance with Commission rules. (Note that payments under this program are made in the order that operators qualify for them. The Commission is limited to total payments of \$500,000 under this program per fiscal year. Operators may not receive more than one payment for a particular well, nor may they receive aggregate payments in excess of the amount of financial security posted under Natural Resources Code §91.104.)
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.89.htm#89.047
State	Texas
Category	Tax Incentive
Citation	Tex. Nat. Res. Code Ann. § 89.047
Title	<i>Exemption for Gas from Reactivated Orphaned Wells</i>
Discussion	An exemption for gas and casinghead gas from a well certified as an "orphan well" by the Texas Railroad Commission. An orphan well is defined in Section 89.047(a)(3) of the Natural Resources Code as one that has a commission permit, has not reported production for the preceding 12 months, and whose current operator's commission-approved organization report has lapsed. When a certified orphan well is put back into production by a certified orphan well operator, the well will be eligible for a 100 percent exemption from natural gas production tax and the oilfield cleanup fee for as long the certified operator operates the well. Effective January 1, 2006.
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.89.htm#89.047
State	Texas
Category	Tax Incentive
Citation	Tex. Tax Code Ann. § 202.060

Title	<i>Exemption for Oil or Gas from Reactivated Orphan Wells</i>
Discussion	See Texas Natural Resources Code §89.047
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.060
State	West Virginia
Category	Laws and Regulation
Citation	WV Code Chapter 22, Article 6-19
Title	<i>Bona Fide Future Use Program</i>
Discussion	Effective July 1, 1993, wells that have not been producing in the previous 12 months can be designated as having a “bona fide future use.” Such a designation would keep idled wells from being deemed abandoned and avoid subjecting them to a plugging obligation. The goal is to return idled wells to production and encourage new wells.
URL	http://www.legis.state.wv.us/WVCODE/Code.cfm?chap=22&art=6#06

Idle Wells

Returning Idle Wells to Production

One of the greatest opportunities for conservation of natural resources lies in returning idle wells to production.

Table 28. Incentives for Returning Idle Wells to Production

State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1002
Title	<i>Tax Incentives — Reestablishment of Inactive Wells and Fields</i>
Discussion	An inactive oilfield that is later returned to production shall be exempted from severance taxes for oil produced from all zones, horizons, and formations that were once productive but have ceased to produce.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1002.htm

State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1002
Title	<i>Tax Incentives — Reestablishment of Inactive Wells and Fields</i>
Discussion	Idle and inactive oil wells (no production for 12 consecutive months) that are restored and re-established as producing wells are exempted from severance taxes for 10 years from the date of renewed production.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1002.htm#http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1002.htm
State	Kentucky
Category	Tax incentive
Citation	Ky. Rev. Stat. Ann. § 137.132
Title	<i>Credit for Production from Recovered Inactive Petroleum Wells</i>
Discussion	The statute gives producers a credit on the 4.5% severance tax imposed on production from oil wells that are brought back into production after having been inactive for two years, or plugged and abandoned.
URL	http://lrc.ky.gov/KRS/137-00/132.PDF
State	Kentucky
Category	Tax incentive
Citation	Ky. Rev. Stat. Ann. § 143A.033
Title	<i>Credit for Production from Recovered Inactive Natural Gas Wells</i>
Discussion	The statute gives producers a credit on the 4.5% severance tax imposed on production from natural gas wells that are brought back into production after having been inactive for two years, or plugged and abandoned.
URL	http://lrc.ky.gov/KRS/143A00/033.PDF
State	Kentucky
Category	Laws and Regulation

Citation	Ky. Rev. Stat. Ann. § 353.730
Title	<i>Investigation of Abandoned Wells -- Application -- Report -- Bond</i>
Discussion	This statute allows producers with a proper testing permit to test inactive wells for 60 days prior to posting bond for the well.
URL	http://lrc.ky.gov/KRS/353-00/730.PDF
State	New Mexico
Category	Tax incentive
Citation	7-29B-1 NMSA 1978
Title	<i>Natural Gas and Crude Oil Production Incentive Act</i>
Discussion	Production Restoration Project. The Act exempts from severance tax (3.75%) wells that had fewer than 31 days of production in any period of 24 consecutive months after Jan. 1, 1993 that are brought back into production. The Act does not apply when the oil price is \$24 or more per barrel.
URL	
State	North Dakota
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-11
Title	<i>Two-year Inactive Well Exemption</i>
Discussion	Idle Wells. Production from oil wells that have been inactive for at least two years and are returned to production is exempt from extraction taxes for 10 years, beginning the first day of the month in which NDIC certification is received by the Tax Commissioner. Affected by price trigger.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
State	Texas
Category	Tax incentive
Citation	Tex. Tax code Ann. § 202.056

Title	<i>Exemption for Oil and Gas Wells Previously Inactive</i>
Discussion	The Two-Year Inactive Well Incentive program, extended by the Legislature in September 1999, remains a valuable opportunity for operators of inactive wells to return the wells to production with a 10-year severance tax exemption on crude oil, casinghead gas, and gas well gas produced by the reactivated wells. The filing deadline for this severance tax incentive program was extended to August 31, 2009. The Railroad Commission can certify wells for the program through February 28, 2010. Any gas well or oil well with no more than one month of production in the two-year period prior to application to the Commission for certification can be eligible. The Commission designates monthly all oil and gas wells that meet the above criteria. Operators of these wells will be notified by letter of their initial eligibility for the exemption. Eligible wells are also identified on the Oil and Gas Schedule listed by operator with a single asterisk. As of November 13, 2000, more 95,000 wells have been designated. If a designated well was returned to production prior to August 31, 2009, and the operator files a W-10/G-10 retest or a W-2 retest, the Commission will send a letter to the operator. By signing the bottom of that letter and returning it to the Commission, an operator is applying for certification in the program. Upon approval, a certification letter will be issued to the operator. This certification, along with Comptroller Form AP-158, is then filed with the Comptroller of Public Accounts to receive the tax exemption. Certified wells are identified on the schedule with double asterisks. As of November 13, 2000, more than 4,000 wells had been certified in the program. If necessary, an operator can request a one-time listing of designated and certified wells for his company.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.056
State	Wyoming
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	Idle wells. Crude oil produced from a previously shut-in well is exempt from severance taxes for the first 60 months of renewed production.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2

Temporary Abandonment

Temporary abandonment delays plugging and abandonment requirements to allow an operator the opportunity to re-work or reestablish production for wells that may be non-producing due to low product price or other factors.

Table 29. Temporary Abandonment Rules and Regulation

State	Kansas
Category	Laws and Regulation
Citation	Kan. Admin. Regs. § 82-3-111
Title	<i>Temporarily Abandoned Wells; Penalty; Plugging.</i>
Discussion	This regulation allows operators more than 90 days of non-production before having to file a temporary abandonment (TA) application. It also provides a framework for non-producing wells that may be fully equipped and capable of production relief from filing for TA approval up to 364 days of non-production and extends the 90-day time requirement for plugging or returning a well back into service. This is to allow operators more time to re-work and re-establish production for wells that may be non-producing for more than 90 days due to low product price or inability to obtain service equipment (pulling units, parts, etc.), without the formal filing of a TA application.
URL	http://www.kcc.state.ks.us/conservation/cons_rr_0704.pdf
State	Kansas
Category	Laws and Regulation
Citation	Kan. Admin. Regs. § 82-3-111 (b)
Title	<i>Temporarily Abandoned Wells; Penalty; Plugging</i>
Discussion	Regulations for temporarily abandoned wells have been modified, placing a cap of 10 years on temporarily abandoned wells.
URL	http://www.kcc.state.ks.us/conservation/cons_rr_0704.pdf
State	Michigan
Category	Laws and Regulation
Citation	Supervisor of Wells Instruction 1-2004

Title	<i>Conditions of Approval of Temporarily Abandoned Status for Oil and Gas Wells</i>
Discussion	Michigan Comp. Laws § 324.61501 lays out rules regulating waste of oil and gas in Michigan. Companies may temporarily abandon up to 10% of wells and greater an even greater percentage with supplemental bonding.
URL	http://www.michigan.gov/deq/0,1607,7-135-3311_4111_36974---,00.html
State	North Dakota
Category	Laws and Regulation
Citation	N.D. Admin. Code § 43-02-03-55
Title	<i>Abandonment of Wells -- Suspension of Drilling</i>
Discussion	Temporary Abandonment of Wells, Suspension of Drilling. This rule defines what constitutes abandonment of a well. The rule also dictates how soon after abandonment a well is to be plugged and the drill site reclaimed. By giving the well temporarily abandoned status, the NDIC director may waive this requirement for one year. The director may extend a well's temporarily abandoned status annually. The director also may approve suspension of the drilling of a well. If suspension is approved, a plug must be placed at the top of the casing. Unless authorized by the director, a well must be plugged and its site reclaimed if drilling has been suspended for 30 days. The goal is to prevent the permanent plugging of wells due to low oil prices.
URL	http://www.legis.nd.gov/information/acdata/pdf/43-02-03.pdf
State	West Virginia
Category	Laws and Regulation
Citation	WV Code Chapter 22, Article 6-19
Title	<i>Bona Fide Future Use Program</i>
Discussion	Wells that have not been producing in the previous 12 months can be designated as having a "bona fide future use." Such a designation would keep idled wells from being deemed abandoned and avoid subjecting them to a plugging obligation.
URL	http://www.legis.state.wv.us/WVCODE/Code.cfm?chap=22&art=6#06

Additional Resources

Protecting Our Country's Resources: the States' Case (2008)

The IOGCC has been studying orphaned wells and the costs and regulations associated with managing these wells since 1992. Over the years, states have been the leaders in implementing innovative programs related to orphaned well management. Most oil and gas producing states have established plugging funds derived from taxes on production, fees, or other assessments to plug wells. However, those funds are insufficient to address timely cleanup of remaining orphaned wells. Therefore, it's essential to establish innovative programs to plug wells.

Published in 2008, *Protecting Our Country's Resources: the States' Case*, was part of Cooperative Agreement DE-FC-26-06NT15567 between IOGCC and the DOE NETL. Research was undertaken as part of a larger effort to assist state governments in the effective, efficient, and environmentally sound regulation of the exploration and production of natural gas and crude oil.

In general, states should be commended for their efforts, both in finding and remediating orphaned wells. The states also have set up regulatory structures that require adequate bonding or insurance coverage to prevent the likelihood of the unfunded liability of orphaned wells in the future.

Produce or Plug (2000)

Published in 2000, and funded by the DOE, *Produce or Plug*, presented an update of its 1992 and 1996 studies of orphaned and idle wells and presented policy makers with a national snapshot of the state of orphaned and idle wells.

One of the most important figures to come out of the study is the number of wells each state has on its waiting list to be plugged. In 1992, the states reported there were 21,155 wells to be plugged. That number had grown to 37,754 in 1996. The 2000 study showed that states are expected to plug 42,403 wells.

Most states have inaugurated significant programs for addressing orphaned wells and should be commended for their efforts. Orphaned wells that predate regulation often go unnoticed because their locations were never recorded. One of the fundamental issues with orphaned wells is that data concerning their existence are inexact. Data collection in the early years was incomplete at best and many owners and operators went out of business as the industry cycled through boom and bust.

States have long recognized their duty to locate and plug orphaned wells and to work diligently to ensure the mechanical integrity of idle wells -- both to protect the environment and to minimize the state's liability due to an operator's financial insolvency.

Case Study: Orphaned and Abandoned Wells – Innovative Solutions

This case study, prepared by the IOGCC, profiles several innovative programs used by IOGCC member states to address orphaned and abandoned wells. The states profiled include California, Kentucky, Pennsylvania, Oklahoma, and Michigan.

States have been creative in finding ways to reduce the potential for adverse environmental impact by plugging thousands of orphaned wells. They also have conserved resources by encouraging the return of orphaned wells to production. Despite making headway, much more work is required before the danger posed by orphaned wells is history.

To ensure that the problem of orphaned wells remains a legacy from the past and not an ongoing problem, states have a variety of regulatory tools at their disposal to prevent premature abandonment of current and future wells. States work on a daily basis to ensure that wells are correctly plugged and abandoned and to identify orphaned wells that may present a danger to the environment. Agencies quickly act to address any immediate threat that presents itself – regardless of ownership and liability issues. The process of identifying and remediating past problems will take time, but states are dedicating significant human and financial resources to ensure the protection of generations to come.

The case study is presented as an appendix to this report.

Conclusions and Recommendations

“As a means toward conservation practices, the compact has been exceedingly effective. It has demonstrated in its results the value of the American principle of local self-government, whereby problems can best be solved by those who have the knowledge and understanding gained from close-at-hand experience.”

*–Governor Payne Ratner, 28th Governor of Kansas, from 1939
- 1943*

Below are presented four recommendations that continue the legacy of the founders of the IOGCC of providing a conservation management approach to regulating domestic oil and gas production.

The recommendations are the embodiment of six core themes central to the mission of the IOGCC. The overarching themes of these recommendations, detailed below, apply to all stakeholders in the regulatory process -- federal stakeholders, state stakeholders, civic and community groups, and industry.

Those six themes are as follows:

- (1) Domestic oil and natural gas production is essential to maintaining and improving the way of life and standard of living in the United States. It is vital to maintaining economic and national security.
- (2) The IOGCC continues to provide an excellent forum for the sharing of best management practices, new approaches, and responsive regulatory programs through its Council of State Regulatory Officials, task forces, and work groups.
- (3) States are best positioned to regulate oil and natural gas production. Individual states have excellent programs to address environmental considerations. There is no “one size fits all” approach because of sweeping differences in climate, geology, geography, social mores and traditions, and factors such as state histories and land ownership
- (4) All parties are encouraged to continue to be responsive to change in an ever-changing technological and regulatory environment.
- (5) Streamlined systems -- from legislation, to permitting, to exploration and production, to plugging and abandonment and site restoration -- by their nature foster environmentally sound conservation of natural resources. Incorporating input from all parties involved ensures responsible development.

- (6) All parties are encouraged to promote “conservation at every level” from the producers of energy to the end users.

Recommendation #1: Orphaned Well Funding

At its 2008 Annual Meeting, the IOGCC, recognizing its role as a leader on the issue of orphaned and abandoned wells, passed Resolution 08.115, calling for the states to continue to actively monitor, identify, and plug orphaned and abandoned wells. The resolution also recognizes that state programs, while effectively and efficiently managed, can address only limited numbers of unplugged wells for which no viable owner can be located. Many of these wells were drilled and completed prior to the development of regulatory programs and pose little threat to the environment. However, some wells can threaten surface water and ground water resources and should be properly plugged. Federal funding assistance would be extremely helpful in boosting state plugging programs, while at the same time creating jobs and eliminating future environmental threats. In addition, surface restoration, often more an eyesore than potential pollution problem, would help eliminate forever the legacy of pre-regulatory drilling and exploration.

Section 349(g)(1) of the Energy Policy Act of 2005 (EPACT 05) states that “[t]he Secretary of Energy shall establish a program to provide technical and financial assistance to oil and gas producing states to facilitate state efforts over a 10-year period to ensure a practical and economical remedy for environmental problems caused by orphaned or abandoned oil and gas exploration or production well sites on state or private land.” Although Congress never appropriated funds for the program, states have nonetheless continued on their own to identify and plug orphaned and abandoned wells. State clean-up and plugging programs such as they exist are funded through a variety of mechanisms including bonding requirements, production and excise taxes on oil and gas development, and in some cases by the voluntary efforts of producers, royalty owners and surface owners.

FEDERAL STAKEHOLDERS

- Work with the IOGCC and other federal agencies in a coordinated effort to develop programs that address the opportunities and obstacles presented by orphaned and abandoned wells.
- Fund continuing research on new technologies and products that lower plugging costs and use environmentally friendly components.

- Provide the necessary funding as set out in EPOA to aid in proper identification, plugging, and abandonment of orphaned wells to ensure those wells shown to be a greatest threat to the environments are plugging first.

STATE STAKEHOLDERS

- To the greatest extent possible, continue efforts to plug orphaned and abandoned wells utilizing prioritization schedules and best plugging practices. Seek opportunities to attract capital or in-kind services to further enhance plugging and surface remediation efforts.
- Continue to devote resources toward locating and identifying orphaned and abandoned wells, especially through the use of leveraged services of community groups that spend time outdoors, such as hunters, fishermen, bird watchers, campers and others. In addition, develop simple educational resources, such as a web site or pamphlet, that describe “what to look for” to identify probable abandoned wells. Devote the necessary time and technical resources to accurately catalog well locations, preferably through the utilization of a Geographic Information System.
- Look for innovative ways to streamline state costs for plugging orphaned and abandoned wells, such as utilization of existing state-owned equipment and expertise, less expensive techniques and materials, utilization of multi-well plugging solicitations, and seeking the benefit of lessons learned in other state, federal and industry programs.
- Request the state’s Congressional delegation to encourage and support reauthorization of §349 of EPOA 05 and to appropriate funds to carry out the program. Such federal support would aid immensely state efforts to properly identify, plug and abandon orphan wells.

CIVIC AND COMMUNITY GROUPS

- Participate in and support regional orphaned well location and plugging programs as described above.
- Participate in and support educational programs about the importance of plugging orphaned and abandoned wells as described above.
- Request the state’s Congressional delegation to encourage and support reauthorization of §349 of EPOA 05 and to appropriate funds to carry out the program. Such federal support would aid immensely state efforts to properly identify, plug and abandon orphan wells.

INDUSTRY

- Continue to use innovative and cost-effective methods for the plugging and abandonment of wells.
- Strive to go “above-and-beyond” in plugging and abandonment operations, including voluntary plugging efforts conducted under state supervision and reporting to the states previously unidentified orphan well locations.
- Support increased funding for identification and plugging of pre-regulatory orphaned wells and the expenditure of both federal and state dollars for this purpose.
- Support efforts in Congress to reauthorize §349 of EPACT 05 and to appropriate funds to carry out the program. Such federal support would aid immensely state efforts to properly identify, plug and abandon orphan wells.

Recommendation # 2: Utilize Essential Data for Critical Decision-making

Good data enable the identification of new prospects, increase the likelihood of successful exploration and production, assist state agencies in monitoring the progress of development, and ensure appropriate environmental safeguards. In the information age, one of the biggest challenges all stakeholders face is to discern what information is necessary for informed decision-making. Databases, Websites and other information streams make it easy to collect reams and reams of data.

To streamline and make regulatory processes effective, stakeholders must critically review and define what data are collected and analyzed by regulatory officials. Reams and reams of data are great if what is valued is quantity. However, for the sake of regulatory streamlining, quality of data is more important than quantity. Stakeholders need tools and processes whereby they are able to discern and process large amounts of data effectively and efficiently. Stakeholders need to be able to take away from the data the valuable information – essentially, the stakeholders must be able to separate the wheat from the chaff. In addition to firsthand experience with the data, refining database matrices and educating stakeholders on the capabilities of the refined databases are essential for disseminating the data necessary for critical decision-making.

FEDERAL STAKEHOLDERS

- Carefully evaluate regulatory requirements to ensure that they are not unnecessarily prescriptive or data-intensive.

- Evaluate the availability of federally controlled data to permit the identification of additional areas of resource potential. Also, publicize information and tools available to the oil and gas industry and state agencies that would enhance regulatory streamlining and resource acquisition. Areas of particular interest could include work by the National Science Foundation, U.S. Geological Survey, U.S. Department of Energy as well as others.

STATE STAKEHOLDERS

- Continue working to improve access to information about oil and natural gas resources, production, and operations to streamline resource finding and development costs.
- Continue sustained efforts involve stakeholders in identifying and developing the kinds of datasets that are particularly useful for locating prospects, drilling program planning, cost analyses, technical evaluations.
- Work interactively with other state and federal agencies to simplify data collecting requirements and processes.

CIVIC AND COMMUNITY GROUPS

- Carefully evaluate information sources to ensure the use of a science-based approach in all areas of regulatory development. Be supportive of efforts by regulatory officials to involve the public in a dialog designed to improve the understanding of the multiple viewpoints and sometimes competing interests. Civil discussions among stakeholders and often produce higher quality regulations that seek win-win solutions to problems.

INDUSTRY

- Utilize experience with collecting and analyzing data to provide input into regulatory processes and data requirements
- Continue collecting and, where appropriate, sharing data with regulatory agencies.

Recommendation # 3: Support the Safe, Responsible Development of Domestic Unconventional Resources

Unconventional resources production should be encouraged under conditions that protect the environment, public health, and safety. It is important that all parties involved understand the

importance of unconventional gas to our economy and energy security as well as the safeguards in place to minimize impacts from natural gas exploration and production.

FEDERAL STAKEHOLDERS

- Recognize the exemplary job by state agencies in regulating the decades-old practice of hydraulic fracturing. States and the U.S. Environmental Protection Agency agree that there has never been a single instance of drinking water contamination as a direct result of hydraulic fracturing. The federal government should support state regulation of hydraulic fracturing and avoid the application of unnecessary provisions of the Safe Drinking Water Act. Further, the Congress of the United States should oppose legislation that removes the exemption for hydraulic fracturing as unnecessary, duplicitous, and an infringement on state authority and regulatory procedures that have been in place for decades.
- Allow the states to participate as a partner should any new studies be undertaken on the impacts of oil and natural gas resource development, including any studies targeting shale oil and gas plays
- Encourage efforts by agencies such as the U.S. Departments of Energy and Environment to strengthen existing relationships with the IOGCC and member states for the purposes of providing financial and technical support, improving efficiency in the use of limited resources, minimizing or eliminating duplication of effort, supporting the national goals of energy production, environmental protection and economic development and improving public understanding of energy-related issues. Seek out additional opportunities for agencies to partner with states on issues of joint concern or interest.

STATE STAKEHOLDERS

- Foster the development of a regulatory environment that permits the development and utilization of technological advances to improve the effectiveness and efficiency of recovering oil and natural gas while at all times maintaining the highest levels of environmental protection.
- Seek opportunities to partner with stakeholders to create a greater public understanding about the role of unconventional fuels in the country's energy mix.
- Spearhead research and information transfer on under-explored and emerging resource plays.

- Recognize the need for long-term transportation and storage contracts that attract long-term, preferred financing of additional gas transportation and storage infrastructure to accommodate future gas demand, while moderating natural gas prices.
- Seek solutions to existing field-to-market bottlenecks, such as the Bakken, and proactively work to head off such barriers in emerging, unconventional plays such as the Marcelles.
- Continually seek to improve regulatory programs for the dual goals of environmental protection and full resource development. Especially in emerging play, seek to inform and involve stakeholders as issues are anticipated or arise. Possible approaches include structured public information systems and a presence in affected communities.
- Participate with the IOGCC on a regional basis to promote the potential for shale gas in the United States' energy future.

INDUSTRY

- Continue to invest in environmentally sound methodologies for responsible unconventional production.
- Go “above-and-beyond” regulatory compliance to ensure that environmental safeguards are in place.
- Recognize the need for long-term transportation and storage contracts that attract long-term, preferred financing of additional gas transportation and storage infrastructure to accommodate future gas demand, while moderating natural gas prices.
- Reach out to the general public to understand and head off confrontations regarding development in previously undeveloped areas.
- Join with states and the IOGCC in seeking streamlined yet effective regulatory structures that achieve compliance while permitting resource development.

CIVIC AND COMMUNITY

- Take advantage of educational opportunities to become knowledgeable about regulatory processes and procedures in place in individual communities.

- Participate in town hall meetings, public commentaries, and other means of community participation for rule development.

Recommendation # 4: Support Production from Marginal and Stripper Wells

Oil production from marginal wells in 2007 accounted for almost 28% of domestic production, or more than 291 million barrels; 2007 natural gas production from marginal wells accounted for approximately 11% of total us production, or 1.763 trillion cubic feet of gas. To shore up production from these marginal wells and to encourage continued investment in marginal well production, many states have adopted incentives to production from these wells. Because marginal production accounts for such a large portion of overall domestic production, and that these low volume wells represent the ultimate in conservation, it is essential to the energy security of the United States.

In fact, the United States is the only country that produces a significant percentage of its oil and natural gas from marginally economic wells.

FEDERAL STAKEHOLDERS

- Work with the IOGCC and interagency in a coordinated effort to develop programs that address the opportunities and obstacles presented by marginal and stripper wells. Continue to support research and development activities through the Department of Energy and the National Energy Technology Laboratory targeting marginal/stripper wells. Federally supported research is critical in this niche area of petroleum production. A large percentage of the producers who own marginal wells are small companies. These producers operate on razor-thin margins that do not permit the “luxury” of research and development. As a result, some of the most important technologies that apply to marginal wells have been sponsored by the federal government and transferred to the marginal-well-owner community by targeted information deployment.
- While developing federal regulations that cut across the industry, weigh the importance of marginal wells to the country’s economic development and energy security. Subjecting low-volume wells to the same regulations as larger producing properties serves as a disincentive to continued production and adds unnecessary costs to those who can least afford it. Production thresholds should remain as a regulatory option that permits a special class of well. This thinking during regulatory development could result in reduced paperwork requirements, less frequent reporting deadlines and eliminating the need for reporting very small quantities of work place

necessities, such as solvents, chemicals and solid waste and even human resource reporting requirements.

- Seek and support cost-effective incentives that produce tax or economic benefits in excess of the cost of the incentives themselves. There are many examples of well-designed incentives that sacrifice short-term tax revenue for the long-term contribution that results from on-going commercial activity.
- Fund outreach activities for marginal well owners. Specific program recommendations include funding the development and deployment of training on a variety of topics such as resource conservation, pollution minimization and prevention, best practices for managing storm water runoff, surface spill mitigation and remediation training and awareness building relating to naturally occurring radioactive materials where higher risk exposure exists.
- Fund efforts to document national contributions by marginal wells to the country's economic development and energy security. This recommendation could be accomplished through an annual report on the volume of marginal production and its predicted contribution to the economy. This report should be widely circulated and serve as an example of responsible conservation practices, environmental protection and successful small businesses.
- Fund an annual survey of incentives employed by oil and gas producing states and the provinces of Canada. A clearinghouse of cost-effective incentive programs would be helpful to avoid the wasteful exercise of "reinventing the wheel."

STATE STAKEHOLDERS

- Continue state incentives and regulatory programs that support marginal and stripper well production and work with marginal well owners to identify other cost-effective options for regulatory streamlining.
- Maintain regulatory flexibility that permits innovative operating practices that protect the environment and prolong production.
- Serve as an advocate for marginal wells and their economic contribution to the state and local economies and their collective importance to the national energy picture. Potential target audiences for advocacy include local officials, federal officials and the general public.

- Continue public outreach operations specifically targeting producers who own and operate low volume wells, many of whom do not have the wherewithal or access to the changing regulatory environment.

INDUSTRY

- Continue developing and transferring technology that allows for the recovery of oil and gas from marginal/stripper wells.

CIVIC AND COMMUNITY GROUPS

- Because the impact of marginal well production has the greatest impact on the local level, community stakeholders have a vested interest in marginal/stripper wells. Civic and community groups are in a unique position to keep the public's attention on the importance of marginal oil and gas production.

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List of Acronyms and Abbreviations

AOGCC	Arkansas Oil and Gas Commission
API	American Petroleum Institute
BLM	U.S. Bureau of Land Management
BOPD	Barrels of Oil per Day
CBM	Coalbed Methane
CCGS	Carbon Capture and Geologic Storage
CDPS	Colorado Discharge Permit System
CEC	California Energy Commission
CEDA	Clean Energy Deployment Administration
CO ₂	Carbon Dioxide
COGCC	Colorado Oil and Gas Conservation Commission
COPE	California Oil Producer's Electricity Cooperative
CS	Cyclic Stream
CSRO	Council of State Regulatory Officials
CWA	Clean Water Act
DMMR	Ohio Division of Mineral Resources Management
DNR	Department of Natural Resources
DOE	U.S. Department of Energy
DOGGR	California Division of Oil, Gas and Geothermal Resources
DOGM	Utah Division of Oil, Gas and Mining
DOI	Department of the Interior
E & P	Exploration and Production
ECOS	Environmental Council of the States
EFD	Environmentally Friendly Drilling
ELMO	e-Learning Modular Objects
EOR	Enhanced Oil Recovery
EPA	U. S. Environmental Protection Agency
EPACT	Energy Policy Act of 2005
ERCB	Alberta Energy Resources Conservation Board
ESRI	Environmental Systems Research Institute
FAQ	Frequently Asked Questions
FERC	Federal Energy Regulatory Commission
FRAC Act	Fracturing Responsibility and Awareness of Chemicals Act
GIS	Geographic Information System
GPS	Global Positioning Systems
GWPC	Ground Water Protection Council
HEM	Helicopter Electromagnetic Survey
IOGCC	Interstate Oil and Gas Compact Commission

IPAA	Independent Petroleum Association of America
KCC	Kansas Corporation Commission
KGS	Kansas Geological Survey
LADR	Leak Detection and Repair
LANDSAT	Land-Remote Sensing Satellite System
LINGO	Low Impact Natural Gas and Oil
LNG	Liquefied Natural Gas
Mcf	Thousand cubic feet
MWD	Measurement While Drilling
NARUC	National Association of Regulatory Utility Commissioners
NBMG	Nevada Bureau of Mines and Geology
NETL	National Energy Technology Laboratory
NGO	Non-governmental Entities
NPDES	National Pollutant Discharge Elimination System
NYSERDA	New York State Energy Research and Development Authority
OBM	Oil-Based Mud
OCC	Oklahoma Corporation Commission
OERB	Oklahoma Energy Resources Board
OFFGASES	Oil Field Flare Gas Electricity Systems
OGEEP	Ohio Oil and Gas Energy Education Program
OOG	Office of Oil and Gas
PDA	Personal Digital Assistant
PPM	Parts Per Million
PTTF	Pipeline Transporations Task Force
RBDMS	Risk-Based Data Management System
RRC	Texas Railroad Commission
SAGD	Steam Assisted Gravity Drainage Technology
SARA	Superfund Amendments and Reauthorization Act
SCAQMD	South Coast Air Quality Management District
SCGIS	Surface Casing Geographic Information System
SONRIS	Strategic Online Natural Resources Information System
STRONGER	State Review of Oil and Natural Gas Regulations
SWC	Stripper Well Consortium
SWDA	Safe Water Drinking Act
TCEQ	Texas Commission on Environmental Quality
TDS	Total Dissolved Solids
TXDOT	Texas Department of Transportation
UIC	Underground Injection Class
USDW	Underground Sources of Drinking Water
USGS	United States Geological Survey

USLL	U.S. Liquids of Louisiana
VRU	Vapor Recovery Unit
WBM	Water-Based Muds
WOGCC	Wyoming Oil and Gas Conservation Commission

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Division of Oil, Gas and Geothermal

COLORADO

Colorado Oil & Gas Conservation Commission

FLORIDA

Florida Department of Environmental Protection

GEORGIA

Georgia Department of Natural Resources

IDAHO

Idaho Department of Lands

ILLINOIS

Illinois Department of Natural Resources
Office of Mines and Minerals
Division of Oil and Gas

INDIANA

Indiana Office of Energy and Defense Department

NEBRASKA

Nebraska Oil and Gas Conservation Commission

NEVADA

Nevada Commission on Mineral Resources
Division of Minerals

NEW MEXICO

New Mexico Oil Conservation Commission

NEW YORK

New York Department of Environmental
Conservation
Division of Mineral Resources

NORTH CAROLINA

North Carolina Department of Environment and
Natural Resources
Division of Land Resources

NORTH DAKOTA

North Dakota Industrial Commission
Department of Mineral Resources

OHIO

Ohio Department of Natural Resources
Division of Resource Management

OKLAHOMA

Oklahoma Corporation Commission
Oil and Gas Conservation

OREGON

Oregon Department of Geology and Mineral
Industries

PENNSYLVANIA

Pennsylvania Department of Environmental
Protection
Bureau of Oil and Gas Management

SOUTH CAROLINA

South Carolina Department of Health and
Environmental Control
Bureau of Land and Waste Management

KANSAS

Kansas Corporation Commission
Oil and Gas Conservation Division

KENTUCKY

Kentucky Department of Natural Resources
Division of Oil and Gas Conservation

LOUISIANA

Louisiana Department of Natural Resources
Office of Conservation

MARYLAND

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Mining Programs

MICHIGAN

Michigan Department of Environmental Quality
Office of Geological Survey

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Mississippi Oil and Gas Board

MISSOURI

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MONTANA

Montana Board of Oil and Gas Conservation

SOUTH DAKOTA

South Dakota Department of Environment and
Natural Resources

TENNESSEE

Tennessee State Oil and Gas Board

TEXAS

Railroad Commission of Texas
Oil and Gas Division

UTAH

Utah Division of Oil, Gas and Mining
Utah Department of Natural Resources

VIRGINIA

Virginia Department of Mines, Minerals and
Energy

WASHINGTON

Washington Department of Natural Resources
Division of Geology and Earth Resources

WEST VIRGINIA

West Virginia Department of Environmental
Protection
Office of Oil and Gas

WYOMING

Wyoming Oil and Gas Conservation Commission

Protecting Our Country's Resources: The States' Case



Orphaned Well Plugging Initiative

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ABSTRACT

This study was performed as part of Cooperative Agreement DE-FC26-06NT15567 with the Department of Energy National Energy Technology Laboratory. Research was undertaken as part of a larger effort to assist state governments in the effective, efficient and environmentally sound regulation of the exploration and production of natural gas and crude oil. Specific projects in the agreement include evaluating the scope of the country's orphan oil and natural gas wells and proposing solutions for permanently sealing these wells, evaluating the impact of new technologies on environmental protection, and assessing technology issues associated with wells nearing the end of productive life. Protecting Our Country's Resources: The States' Case is the culmination of an in-depth study of the country's orphan oil and natural gas wells.

The Interstate Oil and Gas Compact Commission (IOGCC) has been studying orphan wells as an ancillary segment of reports it compiled in 1992, 1996 and 2000. These reports documented the potential presence and estimated numbers of orphan wells in the United States, the plugging costs associated with them, sources of "plugging funds" for individual states, and individual state statutes and regulations associated with orphan wells.

Technology improvements, such as GIS tracking and computerized record-keeping, and introduction of innovative methods for locating orphan wells have allowed states to address identifying and plugging wells that were abandoned years, and even decades ago, by unidentified parties.

Most states define an orphan well as being inactive and having no responsible party to properly plug the well and restore the location. Well owners might have ceased to exist as a business entity or might never have been known. For purposes of this report an orphan well is described as *a well that is not producing or injecting, has not received state approval to remain idle, and for which the operator is unknown or insolvent.*

Site restoration, which involves the removal of equipment, trash and debris, the repair of erosion, and removal of hydrocarbons and closing pits, can prevent potential safety hazards and allow landowners and citizens to employ the impacted area for other uses. In some cases, there is potential for groundwater contamination and wells must be "plugged" to reduce environmental risks.

The responsibility for monitoring restoring well sites, and plugging orphan wells falls inevitably to individual states. Most oil and gas producing states have established

plugging funds derived from taxes on production, fees or other assessments to plug orphan wells. When funds fall short of the need, most states stretch their money by prioritizing wells that pose environmental hazards. Other major issues involving orphan wells are identifying them and subsequently monitoring their condition.

The current study is a continuation of the collection of data associated with orphan wells since 1992 and includes questions intended to provide a more comprehensive view of the situation. Prior years' data were analyzed and reviewed to identify trends, commonalities, and regional differences among the states. Plugging funds, changes and trends are also analyzed to give a more accurate picture of the efforts of the states to address the wells and current orphan well numbers. In addition, anecdotal reports of unique regional issues and innovative solutions are included in the report.

Data were collected by surveying the state regulatory personnel and by obtaining input from industry representatives. State oil and gas agencies were issued a survey via e-mail. The number of actual and possible orphan wells was compiled initially in March 2007 by telephone. The states were then surveyed in May and any contradicting data were resolved. Additionally, state agency representatives were personally interviewed on a one-on-one basis for more information and data confirmation.

There are approximately 50,000 wells awaiting site restoration or plugging. Remediating all sites would be an extremely large burden. Many of these wells have been prioritized according to the threat they pose to the environment. In fact, the majority of orphan wells pose little or no threat to the environment. Others, however, should be plugged in proactive programs to prevent potential environmental impacts.

In general, states should be commended for their efforts, both in finding and remediating orphan wells. The states also have set up regulatory structures that require adequate bonding or insurance coverage to prevent the likelihood of the unfunded liability of orphan wells in the future.

It must, however, be noted that while states have established plugging funds, those funds are insufficient to address timely cleanup of the remaining orphan wells. Therefore, it's essential to establish innovative programs to plug existing orphan wells.

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PREFACE

Since man discovered fire, humans around the globe continuously have sought better ways to generate power, heat and light. The use of petroleum resources actually occurred relatively early. Seep oil, oil naturally rising to the surface in a river or pond, or through a mine, has been collected since the Middle Ages. One method involved damming rivers and creeks with oil seeps located nearby to create a pond where oil could be skimmed from the surface. And, oil has been produced from wells as early as A.D. 347 in China, using bits attached to bamboo poles, which were then pounded into the ground.

It was not until the late 1800s that the value of oil and natural gas as a universal energy source became clear. California may have been one of the first states to harness the “waste” (natural gas and oil byproducts) of water or brine wells to light the Stockton Courthouse. Today, oil and natural gas account for more than 60 percent of energy consumed in the United States. The United States imports a majority, some estimate more than 58 percent, of its oil and around 16 percent of its natural gas supplies. As countries like China develop and world demand grows for petroleum resources, not only will the nation’s domestic petroleum industry become more important, but the stewardship of

existing and potential reserves will also grow in significance. Those, and the many compelling reasons to correctly manage our environment, form the basis of the long standing concern with, and study of, the nation’s orphan wells.

As the recognized authority on this subject, the IOGCC presents this report as a compelling call to action to industry, state governments and agencies and to the federal government. States call on industry to provide responsibly for the plugging and remediation of all current wells and to expand and continue the partnership to address orphan wells. The IOGCC also calls on state government to assess and address regulatory requirements to assure that wells are initiated and managed in an economically and environmentally responsible manner. The IOGCC also calls on the federal government to follow the states’ lead in identifying and plugging orphan wells located on federal properties and to release funding as provided in the Energy Policy Act of 2005.

The IOGCC thanks the states and their representatives for their diligent assistance in compiling the data for this report and for their continued efforts to find and remediate problem orphan wells.

EXECUTIVE SUMMARY

The Interstate Oil and Gas Compact Commission (IOGCC) has been studying orphan wells and the costs and regulations associated with managing these wells since 1992. Orphan wells, defined here as abandoned oil and natural gas wells that have no identified or solvent owner, have been a part of the oil and natural gas industry's landscape since the beginning. One of the fundamental issues with orphan wells is that data concerning their existence is, by definition, inexact. Data collection in the early years was incomplete at best and many owners and operators were lost in the course of history as the industry cycled through boom and bust. Post-regulation, bust cycles have continued to contribute to the number of orphan wells, but not in such daunting numbers.

The first drilling for oil and gas in the United States occurred during the early to mid-1800s. In many states, only a few wells were drilled (many of these dry holes) in the very earliest years, as wildcatters searched widely for oil and gas resources. In states where exploration activities were successful, however, a fairly large number of wells were drilled and produced prior to the enactment of state regulations. Since many of these wells were drilled between 1860 and 1930, the exact number is uncertain. On average, 60 years elapsed between the drilling of the first exploratory well and the establishment of a formal regulatory system. This resulted in the majority of the orphan wells today. In our 1999 survey, member states reported estimates of the number of pre-regulatory wells drilled in their states that indicated a potential on the low side of just over 828,000 to a high side estimate of 1.06 million wells nationally.

Currently, there are around 60,000 orphan wells on plugging lists, a figure that appears not to have shifted greatly despite the states' prodigious efforts at plugging orphan wells. This is due largely to the more aggressive approach states are taking to find the wells. States estimate that potentially more than 90,000 orphan wells exist but remain undocumented at this time. Meanwhile, states are moving to plug the known orphan wells. Some older producing areas are addressing the problem with significant increases in their state plugging funds. Other states have taken the initiative to ensure that the wells posing the greatest environmental threats are plugged first. New York has changed its prioritization to mirror the IOGCC's environmental scoring system for abandoned wells. Similarly, California has adjusted its processes so an "acute orphan well" has priority for plugging. States reporting that

their prioritization schemes for plugging wells have not changed since the last report in 2000 are Alabama, Colorado, Kentucky, Louisiana, Michigan, Nebraska, New Mexico, Oklahoma, Utah, West Virginia and Wyoming. Other states, where production occurred later, benefit from the protection of state laws and regulations at the start of their oil and natural gas history.

"Thankfully, our oil and gas regulations were in place early enough that orphan wells are not a significant problem in Nebraska," said William H. Sydow, director of the Nebraska Oil & Gas Conservation Commission. "At the present time, our agency secures funds through the budget/appropriation process and uses our commission's cash fund to plug and abandon any orphaned wells."

As part of a cooperative agreement with the Department of Energy, IOGCC has been tasked with evaluating the scope of the country's orphan oil and natural gas well situation and the efforts to manage these wells. This report is a culmination of our most current study of the nation's orphan wells and how states address problems associated with these wells. What is clear is that most states have increased their efforts and their expenditures since our first study in 1992 and are earnestly engaged in identifying and remediating orphan wells. Additionally, over the course of this period, states have made significant headway in acquiring and managing orphan well data. Still the total scope of the problem remains somewhat ambiguous.

Over the years, states have been the leaders in implementing innovative programs related to orphan well management. For example, agencies have allowed the sale of orphan wells to operators who believe a return to productive status is a possibility. Other states have considered tax credits for operators who voluntarily plug orphan wells in the vicinity of their active operations.

IOGCC member states trust that some day a report on orphan wells will be unnecessary. Their ultimate goal is to find and plug every orphan well, while taking the necessary precautions to prevent future orphan wells. The IOGCC expresses its appreciation to the participating states and agencies, not only for providing the data that form the core of this report, but also for their creative efforts to find the nation's orphan wells and adequately plug them.

INTRODUCTION

The Interstate Oil and Gas Compact Commission (IOGCC) has been studying orphan wells as an ancillary segment of reports it compiled in 1992, 1996 and 2000. These reports documented the potential presence and estimated numbers of orphan wells in the United States, the plugging costs associated with them, sources of “plugging funds” for individual states, and individual state statutes and regulations associated with orphan wells.

The advent of technology improvements, such as GIS tracking and computerized recordkeeping, and introduction of innovative methods for locating orphan wells has allowed states to begin to fully address identifying and plugging wells that were abandoned years, and even decades ago, by unidentified parties. As part of a grant with the Department of Energy, IOGCC has undertaken the task of conducting a more in-depth evaluation of the scope of the country’s orphan oil and natural gas wells and identifying potential solutions to permanently sealing these wells.

Most states define an orphan well as being inactive and having no responsible party to properly plug the well and restore the location. Well owners might have ceased to exist as a business entity or might never have been known. Some states, such as West Virginia and Indiana, have yet to statutorily define an orphan well. Kentucky and Wyoming define orphan wells as having no bonding. Although terminology used by individual states varies, for the purposes of this report, an orphan well is defined as:

A well that is not producing or injecting, has not received state approval to remain idle, and for which the operator is unknown or insolvent.

The causes of orphan wells are varied. Historically, factors that contribute to the development of orphan wells are a combination of technological capabilities of the era and the economic climate. During the earliest years of petroleum production, wells were literally abandoned. The wooden superstructure might have been salvaged for other uses and as metal replaced wood, the casings and superstructure were sometimes pulled for use in other wells or for salvage value, particularly during the two World Wars when steel was in short supply. The well hole itself was left either unplugged or plugged with tree stumps, logs, mud, or a variety of other readily available materials. Generally, wells drilled prior to the 1930s were shallow and lacked a cement plug. California was the first state to make plugging with cement mandatory,

but by then, the state estimates nearly 30,000 wells had been drilled. As drilling technology and state oversight improved, wells were going deeper and plugging procedures were established. Still, many wells pre-dating 1952 were probably plugged improperly. Early cement plugs were not always effective as their compounds lacked the chemical components to withstand down-hole temperatures and pressure, so failing to harden properly. This led to the establishment of industry standards in 1952. Recurrent bust cycles have contributed to the orphan well inventory.

The responsibility for monitoring and plugging orphan wells falls inevitably to individual states. Most oil and gas producing states have established plugging funds derived from taxes on production, fees or other assessments to plug orphan wells. The earliest funds were established in the 1960s and the latest in the 1990s. The average cost to properly drill out and plug an orphan well varies widely depending on well depth and condition, terrain and other variable factors. It covers a range from \$2,000 to \$40,000, with most states reporting an average cost between \$6,000 to \$12,000. When funds fall short of the need, most states stretch their money by prioritizing wells that pose environmental hazards. The current survey revealed 11 producing states had more than 1,000 wells approved for plugging on lists waiting for state funds. Illinois, Kansas, Kentucky, Louisiana, Missouri, New York, Ohio, Oklahoma, Pennsylvania, Texas and West Virginia all reported waiting lists numbering in the thousands, with Kentucky and Texas reporting the most at 10,600 and 11,220 wells on the waiting list respectively. In some respects, this is a measure of the states’ prodigious work in identifying and documenting orphan wells and as such is a testimony to their diligence. In other respects, it begins to reveal the size and significance of the burden many states face.

“Since the start of the current Texas program in 1991, the Texas Railroad Commission has plugged more than 41,000 wells at a total cost of approximately \$80 million,” said Texas Railroad Commissioner, Victor Carrillo. Although we consider our program a huge success, our current orphan well count still exceeds 11,000 wells. Minimizing, and ultimately eliminating, this orphan well count is a priority for me. Plugging orphan wells is an important environmental goal because it eliminates the potential damage that old, abandoned wells can pose to underground fresh water sources.” Other major issues involving orphan wells are identifying them and subsequently monitoring their condition. Location and

other data pertaining to wells drilled in the first 20 years of petroleum exploration are incomplete at best. Likewise, data concerning wells abandoned by companies that have long vanished also are incomplete. Such wells are often barely visible and are in remote areas where they have gone undetected for decades. Orphan wells can pose both physical and environmental hazards, because hydrocarbons, salts, and ground water migrate. An unplugged well creates a conduit allowing these materials to mingle, either contaminating underground aquifers and water wells, or seeping to the surface to contaminate fields, waterways, or ponds. Similarly, water and salts can migrate into and contaminate petroleum reserves through abandoned and improperly plugged orphan wells. Beyond the contamination, surface seeps can accelerate the risk and ferocity of wild fires. As unplugged wells deteriorate over time, they can cave in on themselves or give way to unsuspecting animals and humans.

The current study is a continuation of the collection of data associated with orphan wells since 1992 and included questions intended to provide a more comprehensive view of the situation. Prior years' data were analyzed and reviewed to identify trends, commonalities, and regional differences amongst the states.

Plugging funds, changes and trends are also analyzed, in order to give a more accurate picture of the efforts of the states to address the wells and current orphan well numbers. In addition, anecdotal reports of unique regional issues and innovative solutions are included in the report.

The report includes sections covering:

- Limitations of the study
- Methodology
- Study results
 - Orphan well statistics: individual and collective
 - Plugging funds
 - Security or financial assurance
 - Salvage value of orphan wells
- Efforts to find and plug orphan wells
- Statutory summary
- Recommendations
- Appendices
 - Domestic orphan wells at-a-glance
 - In-depth state-by-state descriptions
 - Statutory authority and definitions
 - Unique definitions of orphan wells
 - Security or financial assurance
 - Regional and anecdotal information

LIMITATIONS OF THE STUDY

Data on orphan wells were collected from IOGCC member states and international affiliates. Thirty-four of IOGCC's member states participated in the study, of whom eight reported no plugging activity for the period 2000 to 2006. Another 10 reported plugging activity in the hundreds, nine reported in the thousands. Again, for purposes of this study, an orphan well is defined as a well that is not producing or injecting, has not received state approval to remain idle, and for which the operator is unknown or is not solvent. At this point, there are no standardized data collection requirements for the classification of orphan wells. Each of the oil and natural gas producing regions of the United States has unique variables to contend with such as geologic formations, local and state regulations and regulatory structure, and data collection methodologies.

Among the data collected were the number of orphan wells plugged, the number of orphan wells on each state's plugging list, and the estimated number of unidentified and/or undocumented orphan wells that could potentially exist. This estimated number was gathered in hopes of anticipating the potential long-term costs to plug wells that have not yet been found. Bonding information has been compiled to demonstrate how the states are taking preventive measures to deal with abandoned and idle wells on-going, to keep wells drilled today from becoming the liability of state taxpayers in the future. Plugging regulations and prioritization schemes have been collected so the states can view the wide range of alternatives. As well, information on average cost to plug and the funds and funding sources was compiled. Statutory definitions and authority specific to orphan wells and preventing them also have been compiled.

METHODOLOGY

Data were collected by surveying the state regulatory personnel and with input from industry representatives. State oil and gas agencies were issued a survey via e-mail. The number of actual and possible orphan wells was compiled initially in March 2007 by telephone. The states were then surveyed in May and any contradicting data were resolved. Additionally, state agency representatives were personally interviewed on a one-on-one basis for additional information and data confirmation.

The study questionnaire requested information on a range of topics to provide insights into state programs addressing orphan wells. The information obtained from the states falls within the following categories:

Orphan well data. States were asked to provide the number of wells plugged, the amount of plugging funds expended, and an estimate of the number of unidentified and / or undocumented orphan wells in their state.

Plugging funds. Many states have established plugging funds to ensure that wells are properly plugged and abandoned. Several states have increased the amounts of these funds in recent years.

Security or financial assurance. Most states require some form of security or financial assurance. The methods and amounts vary, but financial assurance is required on most wells to ensure proper plugging and abandonment - even in the case of operator insolvency.

Salvage value of orphan wells. Most states can salvage lease equipment or hydrocarbons left in storage tanks and use the salvage value to offset the cost of state-funded plugging.

Efforts to find and plug orphan wells. Several states have developed programs to help find and plug orphan wells. They range from volunteer groups searching for orphan wells to states offering tax incentives to landowners willing to adopt an orphan well.

Statutory authority. Authority dealing with orphan wells.

Anecdotal information. Many states have unique regional and/or regulatory environments that provide more insight into the orphan well situation and may provide a basis for further study.

Additionally, prior years' survey data were consolidated and analyzed beginning with the initial survey year of 1992 serving as the base year. Inconsistencies were identified, adjusted and verified with the reporting state agency on a case-by-case basis. This is intended to provide a comprehensive view of orphan well status and trends since the inception of research.

DISCLAIMER

Although many efforts were made to test the accuracy and consistency of the data, conflicts remain as a result of several inherent areas. States differ as to fiscal years and data collection in the states may adhere to fiscal year time frames or may follow calendar years. Some states have broad responsibilities for plugging a variety of wells (orphan, insolvent but known operator, etc.) while others address only orphan oil and natural gas wells as defined in this study. Some states use plugging funds for site remediation, while others have separate funds. Some states consider site remediation costs as part of the cost to plug and others do not. Some states

reported data in our earliest reports that cannot be supported currently. While the states and their staffs have gone far above and beyond the call to assist us in every way to bring the basis of this data into conformity, there is still the chance that some data presented in this report may contain flaws. However, we believe that such flaws, if they exist, are not materially significant to the purpose of this report, which is principally to establish the existence and direction of states' efforts toward addressing orphan wells.

STUDY RESULTS

ORPHAN WELLS

Orphan Well Plugging Wait List. Surveyed states reported 59,222 wells on plugging or site remediation waiting lists in 2006. Since the initial study in 1992, states have reported steady increases to the number of wells on their wait lists, despite marked increases in the number of wells plugged and funds expended each survey period. States continue to locate formerly undocumented wells for a variety of reasons such as the advent of technology improvements like GIS tracking and satellite photography, computerized record-keeping, and the introduction of innovative methods for locating wells.

With 11,220 orphan wells on its plugging list, Texas reports having the most identified orphan wells waiting to be plugged, with Kentucky not far behind with 10,600. Pennsylvania and Kansas report 8,700 and 7,271 wells on waiting lists, respectively. The next cluster of significant numbers is reported by New York at 4,800, Illinois at 3,900, Louisiana at 3,183, Oklahoma and Ohio at 2,089 and Missouri at 2,000.

The number of wells waiting to be plugged in individual states at any given time may depend on a variety of factors, such as the number of oil and gas wells within the state regulatory program, the adequacy of security or financial assurance provided by oil and gas operators, the availability of state plugging funds and staff resources, and state procurement procedures. Legal issues arising from insolvency also can delay plugging by either operators or the state.

Undocumented / Unidentified Orphan Wells. In 1996, the states were asked to provide a high to low estimated range of the number of undocumented or unidentified orphan wells. This year, surveyed states were asked to estimate the number of undocumented or unidentified orphan wells not on their plugging wait lists. Surveyed states used a variety of methods to estimate the amount of undocumented or unidentified wells in their regions, from an estimate based upon historical figures, to a calculation of a percentage of wells on their current lists.

Figure 1. Total estimated orphan wells: all surveyed states (2006)

State	Wait list	Undocumented	Total Orphan Wells
Alabama	0	3	3
Alaska	15	0	15
Arkansas	577	1,200	1,777
California	430	967	1,397
Colorado	45	45	90
Florida	17	150	167
Illinois	3,900	0	3,900
Indiana	598	1,300	1,898
Kansas	7,271	10,729	18,000
Kentucky	10,600	2,500	13,100
Louisiana	3,183	625	3,808
Michigan	100	15	115
Mississippi	49	0	49
Missouri	2,000	0	2,000
Montana	90	475	565
Nebraska	6	6	12
New Mexico	134	0	134
New York	4,800	40,000	44,800
North Dakota	4	0	4
Ohio	2,089	9,000	11,089
Oklahoma	2,089	10,000	12,089
Pennsylvania	8,700	0	8,700
Tennessee			
Texas	11,220	0	11,220
Utah	8	59	67
Virginia	37	70	107
West Virginia	1,260	13,000	14,260
Wyoming	0	5	5
Grand Totals	59,222	90,149	149,371

Figure 2. Total Estimated Orphan Wells

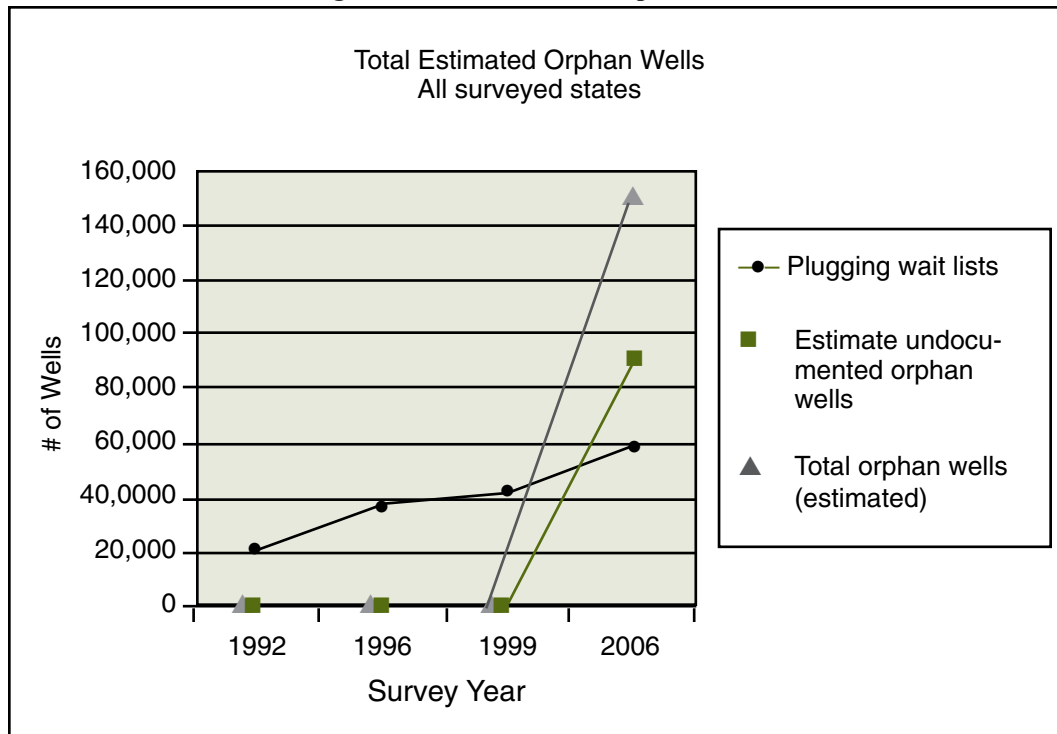


Figure 2 shows the total estimated orphan wells for all surveyed states. Prior studies reported only the number of wells on waiting lists (line). 2006 survey respondents were asked to estimate the number of undocumented and/or unidentified wells (square), which, when added to wait list figures provides an estimate of the total number of orphan wells in the nation (triangle).

The range of undocumented and/or unidentified wells is wide. Some states declined to provide an estimate, while others used a formula based on the number of undocumented wells that are discovered on average in a year and projecting forward. Six of the surveyed states, Alaska, Illinois, Missouri, North Dakota, Texas and Pennsylvania did not provide an estimate of undocumented wells. Historically, Alaska, New Mexico and North Dakota have a smaller amount of wells on their wait lists as compared to other states. The states which, in this survey, estimated the highest potential number of undocumented wells include New York with an estimate of 40,000, West Virginia with 13,000, Kansas with 10,729 and Oklahoma with 10,000. In all cases, these estimates were lower than the original low to high estimate range that states provided in 1999, which is likely indicative of the progress these states are making. Arguably, any estimate is a fluid number and is not, in itself, important. Rather this estimate is significant as an indicator of the potential cost to plug and remediate to which the states may be exposed.

As unplugged orphan wells are identified, they are generally included on waiting lists or databases established by the states and prioritized for plugging and abandonment. States prioritize among wells to be plugged, focusing on those that pose the greatest potential harm. It should be noted that states plug wells other than orphan wells and these wells affect the waiting list. Also, some orphan wells may later be adopted by an operator and returned to production or other use.

PLUGGING FUNDS

Most states have established plugging funds that vary widely, both in scope and funding mechanisms, to ensure that wells for which no or insufficient financial assurance exists are properly plugged and abandoned. As orphan wells are identified, they are included on waiting lists established by the states and prioritized for plugging. The number of wells on each state's waiting list may be different from the number of orphan wells because: states plug wells other than orphan

wells; some orphan wells may later be adopted by an operator and returned to production or other use; or because states prioritize among wells to be plugged, focusing on those that pose the greatest potential harm.

The plugging of orphan wells by state regulatory agencies remains a significant issue. While most states have increased the amounts in their plugging funds in the last six years, some states have maintained the same amount. New Mexico established an Oil and Gas Reclamation Fund in 1977. Well operators pay a percent of taxable value of sold products, of which a percentage goes to the fund. In the reporting period, New Mexico expended \$6,130,113 from the fund to plug 396 wells. Missouri and Nebraska reported the lowest expenditures and minimal plugging activity for the period \$23,890 / 8 wells and \$35,000 / 5 wells respectively. However, while Nebraska has a relatively small number of orphan wells on their data list, Missouri reports about 2,000. The number of wells waiting to be plugged in individual states at any given time may depend on a variety of factors, such as the number of oil and gas wells within the state regulatory program, the adequacy of security or financial assurance provided by oil and gas operators, the availability of state plugging funds and staff resources,

and state procurement procedures. Legal issues arising from insolvency can also delay plugging by either their operators or the state.

Plugging funds expended.

In the 1999 report 10 states reported spending \$1 million or more on plugging orphan wells, with Texas far and away the leader at a reported \$30.8 million. In the 2006 survey, 16 states reported spending \$1 million or more, with 5 states spending between \$1 and \$3 million, 3 states at \$5 to \$6 million and 6 states spending between \$8 and \$13 million, and 2 states spending upward of \$26,000. Fourteen states reported significant increases in spending for the 2000 to 2006 period over the prior report, in some cases as much as 17 times as much or more. Three states reported declines in spending, while 5 states reported spending consistent with prior periods. Clearly as states have addressed the identification of orphan wells and as the industry's fortunes have improved over recent times, states have been exceptionally diligent in addressing the need. *Data tables are located in the Appendices.*

Figure 3. Percent increase in wells plugged: All surveyed states by survey year

<i>Survey Year</i>	<i># of Wells</i>	<i>% increase (decrease)</i>
1992	7,606	
1996	12,274	61.37%
1999	23,658	92.75%
2006	28,089	18.73%
Total	71,627	

Figure 4. Total plugging funds expended: All surveyed states by survey year

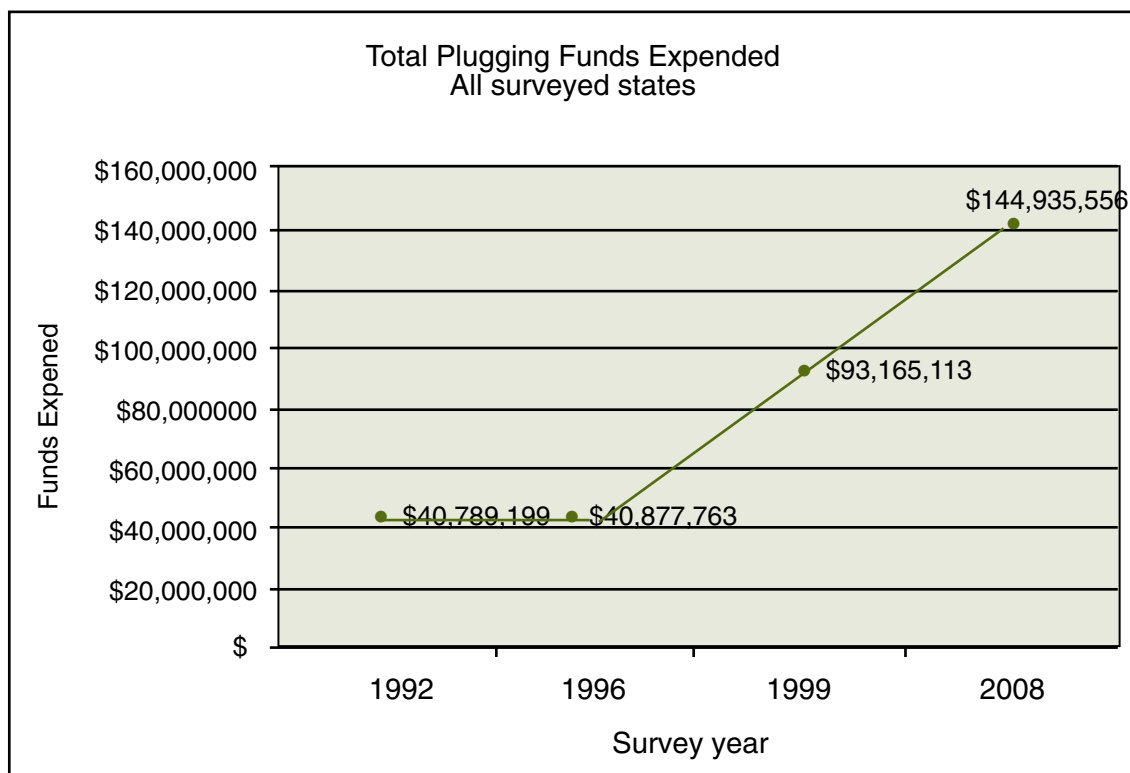
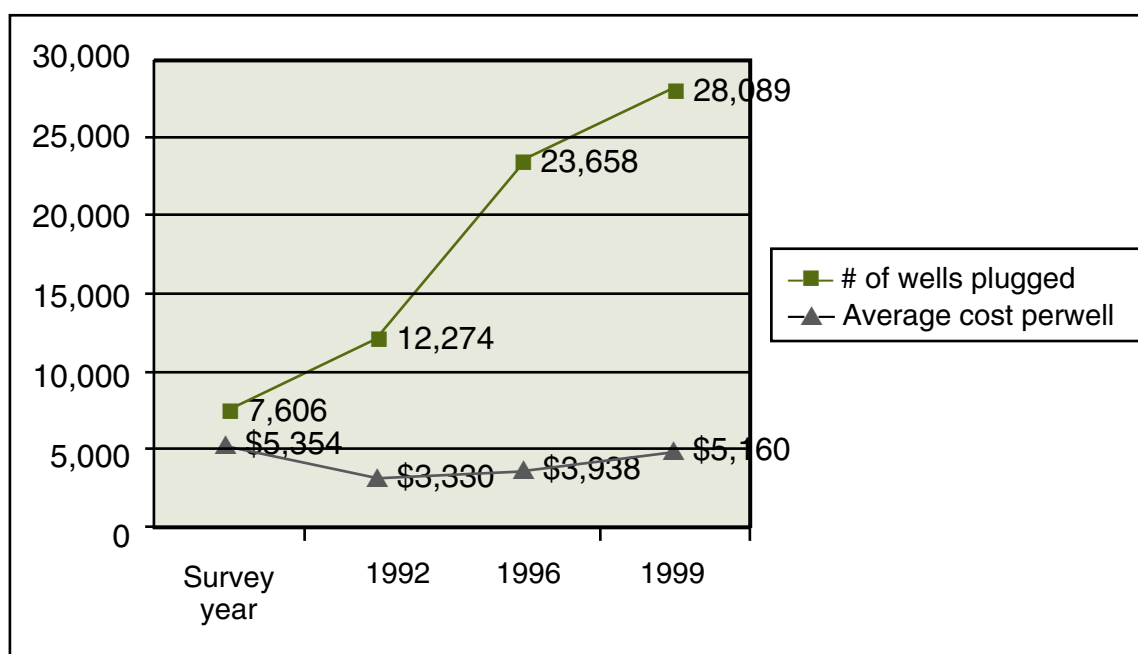


Figure 5. Total wells plugged by survey year/Average cost per well



Sources of state plugging funds.

The mechanisms used to supply the needed money to the state plugging funds vary greatly. Some states use general appropriations, but most state plugging funds sources can be grouped into four general categories: fees, public funds, revenue, and taxes. Individual states often leverage many different sources to address plugging orphan wells. For example, Michigan, Montana and Pennsylvania have two funds that can be used for the plugging of orphan wells. Michigan has an Environmental Remediation fund and an Orphan Well Fund. Pennsylvania has an Abandoned Well Plugging Fund and an Orphan Well Fund. Montana has a Resource Indemnity Trust Tax and a Damage Mitigation Account, which is funded by statutory appropriation plus bond forfeitures. From 1992 until 2005, Arkansas used general funds on a case by case basis to plug orphan wells. In 2005, the state established a Plugging Fund, which has benefited their efforts significantly. In almost every case, the sources of funding are inextricably tied to the oil and natural gas exploration and production industry in each

state. Levies, assessments, bonds or taxes are imposed on well operations and production. As a result, as the market price for oil and natural gas encourages exploration and production as it has over the recent period, funding available to states also improves. However, states are also tasked with addressing many long, unfunded needs, such as highways and bridges, so that funding for plugging orphan wells is not always a given. And, even with improved funding, the need often outstrips resources. Survey data shows that states have spent roughly \$319.1 million to plug and remediate 71,618 wells nationally, for an average cost of \$4,456 per well. If all of the nearly 150,000 orphan wells identified in this survey required state plugging, the cost to the state oil and gas regulatory agencies would be in excess of \$668 million. The reported balance in state plugging funds currently totals about \$2.8 million, which is insufficient to cover the probable plugging costs to address the 59,781 orphan wells on the states' waiting lists.

Figure 6. Sources of Plugging Funds: All surveyed states

<i>State</i>	<i>Fee</i>	<i>Fine</i>	<i>Public Revenue</i>	<i>Tax</i>
Alabama				
Alaska			✓	
Arkansas	✓			
California	✓			
Colorado				
Illinois	✓			
Indiana	✓	✓		
Kansas	✓			
Kentucky				✓
Louisiana				
Michigan				
Mississippi	✓			
Missouri		✓		
Montana				✓
Nebraska	✓			
New Mexico				✓
New York	✓	✓	✓	
North Dakota	✓	✓	✓	✓
Ohio				
Oklahoma				✓
Pennsylvania	✓			
Tennessee		✓		
Texas				
Utah				
Virginia	✓			
West Virginia				
Wyoming				

Figure 7. Sources of state plugging funds

Fees	
Annual fee	A routine fee charged to operators of oil and gas wells
Idle well fee	A fee that operators pay for an inactive, unplugged well
Permit fee	A fee that operators pay when they get a permit to produce
Civil penalties	Penalty imposed by regulating authority for noncompliance
Settlements	
Public Funds	
Appropriations	Legislative action authorizing the expenditure of public (state or local government) funds for some designated purpose
Operating budget	State Oil and Gas Agency operating budget
Revenue	
Forfeited bonds	Deposited monies paid to ensure adequate funding is available for inactive well plugging by operators
Salvage	Proceeds from the sale of any equipment or other items of value at plugging site
Taxes	
Excise tax	Tax imposed on the sale of specific goods or services, or on licenses to engage in certain activities (also called mil levy, conservation tax)
Production Assessment	A state or municipal tax on oil and gas products levied at the wellhead for the removal of the hydrocarbons. (Also called Severance Tax)

SECURITY OR FINANCIAL ASSURANCE

The primary purpose of security or financial assurance requirements in the producing states is to ensure proper plugging and abandonment of oil and gas wells in the event the operator becomes insolvent. Many states have made recent changes to upgrade their security and financial assurance requirements. The majority of oil and gas producing states require specific security or financial assurance in the form of a surety bond, cash, certificate of deposit or irrevocable letter of credit. The security or financial assurance can be used to ensure performance, plugging of the wellbore at the time of abandonment, restoration of the surface, or a combination of any of the above. The date that security or financial assurance requirements were established varies widely among the states, but the states where production started most recently have required security or financial assurance since the inception of their programs. States have security requirements for single wells as well as blanket bonds. Single well security may be based on well depth (15 states), a set fee structure (15 states), a hybrid of the two (North Dakota), or by acre of disturbed land (Virginia). Blanket bonds may likewise be based on the number of wells (8 states), a set fee structure (17 states) or a hybrid of the two (4 states).

**Figure 8. Distribution of Security Types:
All surveyed states**

Type of Security	# of states	% of states w/ type*
CD	24	80%
Cash	24	80%
Certificate of Insurance	1	3%
Escrow Account	2	7%
Financial Statements	7	23%
Letter of Credit	16	53%
Liens	2	7%
Security Interest	2	7%
Surety & Performance Bonds	30	100%
*30 states surveyed		

Figure 9. Types of Securities Permitted by States

Type	Definition
Cash Deposit	A payment given as a guarantee that an obligation will be met
CD	Certificate of Deposit
Certificate of Insurance	A formal document used to record a fact and used as proof of the fact
Consolidated Financial Fund	A user-defined combination of several consolidation units, grouped together for consolidation and reporting purposes
Escrow Account	A separate bank account, segregated from a broker's own funds, in which the broker is required by state law to deposit all monies collected for clients; in some states called a Trust Account
Financial Statements	A report of basic accounting data that helps investors understand a firm's financial history and activities
Letter of Credit, Irrevocable	A letter of credit where payment is guaranteed as long as the seller meets all conditions stipulated. A revocable letter of credit can be cancelled or altered by the buyer without permission of the seller
Liens	The right to take another's property if an obligation is not discharged
Performance Bonds	A surety bond between two parties, insuring one party against loss if the terms of a contract are not fulfilled
Security Interest	The creditor's right to take property or a portion of property offered as security
Surety Bonds	A contract by which one party agrees to make payment on any default or the debt of another party

SALVAGE VALUE OF ORPHAN WELLS

While orphan wells represent an economic liability to the state as there is often inadequate or non-existent security to cover the cost of plugging these wells and the state must plug the well first and then attempt to claim the security, orphan wells are not necessarily without economic value. On younger wells, lease equipment, hydrocarbons in storage tanks on the location and hydrocarbons that remain in the reservoir have value. Some states attempt to realize any benefit from the assets remaining on such wells. Three states, Arizona, Nebraska and Utah, attempt to determine the potential value of remaining reservoir hydrocarbons prior to plugging a well. These states look variously for the potential of enhanced recovery methods and remaining production potential. Utah, along with a few other states, contacts operators of surrounding leases for interest in taking over an orphan well. In many cases, operators will do so to protect their hydrocarbon reservoirs and as good corporate citizens.

Older wells do not frequently offer much in the way of salvage value. Texas has one of the most active well plugging programs. It reported only a very few wells had an equipment salvage value greater than the plugging costs. Usually equipment on the older wells, if still in place, has no resale value, only scrap metal value. In most states the contractor who plugs the well is allowed to take possession of the equipment, reducing the cost of plugging proportionate to

the salvage value of the equipment. While some states have experienced difficulties in the bid evaluation process, this has generally proven to be an efficient and cost-saving solution.

IOGCC: Lending a helping hand for the future

On a national front, the IOGCC has been committed to securing federal funding for the plugging of orphan wells. While states have made extensive efforts to find and plug their wells, federal funding could accelerate plugging wells posing the greatest hazards.

"There are believed to be tens of thousands of orphan wells in this country. Many of these wells are very shallow and pose no risk to the environment. However there are others that are unplugged or inadequately plugged and are a genuine threat to the environment and safety. We have to focus on these problem wells and we are working with Congress on federal funding for a permanent fix."

- North Dakota Governor John Hoeven, former chairman of the IOGCC, May 10, 2007, IOGCC 2007 Midyear Issue Summit.

EFFORTS TO FIND & PLUG

Most states have inaugurated significant programs for identifying and addressing orphan wells. The states should be commended for these efforts, and the IOGCC will continue to encourage all states to find ways to identify and address their orphan wells. Following are some innovative efforts by states to gather resources, to search for wells, to plug them, or to utilize them.

Pennsylvania: A Case Study

Pennsylvania has produced oil and natural gas since 1859 and for the first forty years was responsible for nearly half of the world's production of oil until the east Texas oil boom in 1901. Most of Pennsylvania's production of the period occurred around Titusville, in an area now known as Oil Creek State Park. Without the benefit of geologic science, Pennsylvania oilfields were discovered by physical evidence such as surface oil seeps. Wells were drilled at random and often very close together. A famous tintype from 1871 shows a location known as Triumph Hill with a veritable forest of wooden derricks. It would only be much later that petroleum engineers would understand that drilling too many well too closely together actually reduces production capability, as well as increasing environmental damage. At the time, all anyone worried about was fire. Drake's first well lasted only a couple of months before being consumed by fire.

With its long history of petroleum production, Pennsylvania was particularly concerned with orphan wells. Oil Creek State Park falls under the jurisdiction of the Pennsylvania Department of Conservation and Natural Resources (DCNR). To augment a small staff, the Park Manager would recruit summer interns to help canvas the park in search of orphan wells. Then, in 2002, a partnership was developed involving the Pennsylvania Department of Environmental Protection (DEP), the Environmental Alliance for Senior Involvement (EASI), and the Pennsylvania Senior Environment Corps (PaSEC), a statewide network of seniors who monitor water resources. EASI is a national nonprofit coalition of environmental, seniors, and volunteer organizations founded in 1991 following an agreement between the U.S. Environmental Protection Agency (EPA) and the American Association of Retired Persons (AARP). EASI typically partners with national, state, and local public and private organizations to provide opportunities for seniors to play an active, visible role in improving the environment in their communities.

PaSec, EASI, the Venango Conservation District, the DCNR and DEP established a pilot project

to train and equip senior volunteers to locate and mark orphan wells in Oil Creek State Park. The Park offered a ready combination of key success factors for the project: state land ownership providing access and administrative support, a large probability of orphan wells resulting from historical activity, and an active PaSEC volunteer cadre ready to go. DEP provided a startup grant of \$40,000.

"This is a tremendous opportunity to protect the environment in this beautiful state park, and potentially throughout northwestern Pennsylvania, where thousands of these abandoned, orphan wells exist. Oil can seep into and contaminate groundwater and surface water. Sinkholes can develop around these old wells, presenting a danger to hikers, hunters, and all visitors to Oil Creek State Park," said Pennsylvania Secretary of Environmental Protection Kathleen A. McGinty.

EASI has existing training programs for its members for its water monitoring projects. These programs include safety, site location and recording methodology. DEP and DCNR added training in operating hand-held global positions system units, mapping coordinates and downloading data for transmission to state databases. While in the field, volunteers had the support, as needed, of the Venango Conservation District and the Bureau of Oil and Gas management, DEP. The funding proficed hand-held GPS units, first aid kits, topographical maps and compasses, briar-proof pants, orange safety vests and hats, computer software, markers, flag and tags and digital cameras, as well as portable radios and walkie-talkies to communicate with state park personnel.

"We always go out in teams, no less than three and I'd say six is about the most. We get in a spaced line, set a bearing and head for it. It's hard to keep the line with the way the terrain dips and rises, but it's important for safety and to be sure we're covering the area. Sometimes a well site is just a depression in a field, maybe three or so feet across. We test the surface to see it's an open shaft. We take photos, enter a description of the site and record the latitude and longitude. The report goes to the Venango Conservation District and the DEP, who verifies the data and adds the sites to the official list," said John Kolojejchick, one of the senior volunteers participating in the Oil Creek pilot program.

As of October 2003, the PaSEC volunteers had identified 57 potential orphan wells. By June 2007, the volunteers have found and marked more than 317 orphan wells in Oil Creek State Park. With the pilot program proving so successful, the project alliance moved forward to launch a second phase, with an additional \$20,000 in funding and the desire of the seniors to increase the area of interest and build participation in the

program. Four areas were added to the project to include some game lands and forestry preserves. Four years since inception, the project has found, marked, and stored in the database the location of more than 360 orphan wells. They have logged 880 volunteer hours and spent a mere \$60,000. More than 225 of these wells have been plugged.

In addition to its extensive efforts to find and plug orphan wells; Pennsylvania also is attempting to track down liable operators. Where the state determines that a prior owner or operator received economic benefit subsequent to April 18, 1979, other than benefit derived only as a landowner or from a royalty interest, from an orphan well or from a well which has not been registered, such owner or operator is held responsible for plugging of the well.

Pennsylvania's orphan well program demonstrates that identifying orphan wells need not be a job restricted to the young or professional, or for that matter, those who get paid to do it. Nor does it necessarily require an extensive budget. The key ingredient for success is collaboration. Pennsylvania used a collaborative style that extended beyond agency offices to embrace the support and involvement of the community. By sharing resources, expertise and support, the project became affordable and effective.

California: Adopt-a-well

California's Orphan Well Program has been authorized to plug and abandon idle-deserted wells since 1976. From 1977 to 2004, 1,062 orphan wells were plugged at a cost of \$14.8 million. The program is authorized to spend up to \$1 million a year to plug orphan wells. A list of orphan wells in the state is maintained for adoption under the "adopt a well" program. This program allows prospective operators to enter into an agreement to test for further extraction of an orphan well for up to 90 days without incurring any liability for plugging. After this time, if the test is successful, the prospective operator can then adopt the well by posting a bond and becoming its permanent operator. If the test is unsuccessful, the prospective operator can walk away from the agreement without incurring any liability.

Oklahoma: Voluntary assessment

In 1993, leaders representing Oklahoma's oil producers and royalty owners, working with the Oklahoma Legislature, formed the Oklahoma Energy Resources Board (OERB). Oklahoma's natural gas producers joined soon after. At the heart of OERB's mission is the on-going commitment to restoring Oklahoma's orphaned and abandoned well sites left by operators who have since disappeared. Site restoration

includes (1) the removal of equipment, concrete, trash and debris; (2) soil erosion and scarring repair; (3) the removal of hydrocarbons; (4) closing of pits; and (5) the removal of lease roads and location pads (OERB 2008). Funded through a voluntary assessment paid by producers and royalty owners on the sale of oil and natural gas in Oklahoma, OERB's environmental restorations cost landowners and taxpayers nothing. Since 1994, Oklahoma's oil and natural gas producers and royalty owners have voluntarily contributed \$70 million. OERB has restored more than 7,800 abandoned sites.

Texas: Production tax incentives

As an incentive to put orphan wells back into production in Texas, the Legislature passed a bill to exempt gas and casinghead gas from any well the Texas Railroad Commission certified as an orphan. When the certified orphan well is put back into production by an approved operator, the well is eligible for a 100 percent exemption from natural gas production tax and the oilfield cleanup fee for as long as the certified operator manages the well.

Michigan: Industry support

Michigan's Orphan Well Fund was established in 1994 with revenue from a severance tax on the oil and gas industry. Two percent of the severance tax revenue, but not less than \$1 million, is credited to the fund annually. This funding goes toward plugging, response activity, or site restoration at abandoned or improperly closed oil and gas wells. For Fiscal Year 2004-2005, the total cost for plugging, response activity, and site restoration for all projects was \$1,167,235. However, \$164,463 was returned to the Orphan Well Fund as a result of sales from well tubing, casing, and equipment, and \$67,610 from the collection of well bonds. Fiscal Year 2004-2005 represented the tenth year that funds were expended from the fund. Nineteen wells were plugged, interim response activities were performed on three wells, and eight oil storage tanks were remediated.

Michigan also deposits funds from salvaged equipment from plugged well sites into their Orphan Well Fund. In 2006, the value of salvage totaled \$160,845. Further, the Office of Geological Survey posts a list of orphaned wells on its Web site. Operators are allowed to take over orphaned wells if they get leases for the minerals under the original drilling unit.

CANADIAN PROVINCES

The U.S. is not unique in dealing with the issue of orphan wells. All oil and gas producing countries have similar issues. In Canada, the provinces have taken aggressive steps in partnership with industry to identify and reclaim orphan wells, pipelines and facilities.

Alberta: Government/Industry collaborative partnership

Alberta has an Oil and Gas Orphan Abandonment and Reclamation Association operating as a non-profit organization under the registered trade name of the Orphan Well Association (OWA). The OWA operates under the delegated authority of the Alberta Energy and Utilities Board (EUB). OWA was established as a joint initiative between the upstream oil and gas industry and the provincial government in January 2002 and commenced operations on April 1, 2002. The Alberta government supports this initiative to deal with upstream oil and gas orphans through its regulatory agencies, Alberta Energy and Utilities Board (EUB) and Alberta Environment (AENV) which: (1) initiate appropriate enforcement actions to ensure that the responsible parties address their obligations to deal with their well and facility abandonment and reclamation liabilities, and (2) develop appropriate policies to minimize unfunded orphan liability and to prevent new orphans. The purpose of the OWA is to manage the abandonment and reclamation of upstream oil and gas orphan wells, pipelines, facilities and their associated sites.

The OWA provides information on its activities to a stakeholder group known as the Fund Advisory Committee or FAC. The FAC provides advice and input into the ongoing development of government policies related to upstream oil and gas orphans. Members of the FAC include representatives from industry - Canadian Association of Petroleum Producers (CAPP), Small Explorers and Producers Association of Canada (SEPAC), and representatives from the provincial government - the Alberta Energy and Utilities Board (EUB), Alberta Environment (AENV), Alberta Department of Energy (AE), and Alberta Sustainable Resource Development (ASRD).

The OWA operates under the direction of its members who include: the Canadian Association of Petroleum Producers (CAPP), the Small Explorers and Producers Association of Canada (SEPAC), and the EUB. Industry funds all of the costs incurred by the OWA, mostly through an Orphan Fund Levy. This levy is based on the abandonment and reclamation liabilities held by each company and it is collected annually by the EUB and remitted to the OWA.

Fiscal Year 2005/06 was a benchmark year of operations

for OWA. Expenditures on operational activities increased to an historical high of almost \$12 million compared to almost \$9 million the previous year. The focus of OWA's operations shifted in 2005/2006 from well abandonment to site reclamation, allowing OWA to catch up on its inventory of outstanding well abandonments. A significant proportion of OWA's operations was dedicated to remediation (dealing with contaminants) on orphan sites.

Saskatchewan: Updates its regulations

Saskatchewan Industry and Resources recently announced efforts to revise its regulatory environment to make it more relevant to current oil and gas development practices and technology. In 1989, the province had established an Oil and Gas Environmental Fund to address the costs of reclaiming orphan wells. Government and industry leaders have worked together as a group to establish new funding rules. The proposed changes address two key components: a security deposit system and an annual orphan fund levy. A security deposit is collected from companies whose liability is greater than their assets, with the difference between the two comprising the amount of the security deposit. This serves the dual purposes of preventing an individual without sufficient economic means from acquiring oil and gas wells or facilities and secondly should the company become bankrupt, then the security deposit will cover the cost of decommissioning and reclaiming the orphan property. In a case where the security deposit amount is insufficient to cover the cost of the necessary work, all of the oil and gas companies operating in Saskatchewan will be levied a fee, *The Orphan Fund Levy*, to make up the shortfall.

RECOMMENDATIONS

There are approximately 50,000 wells awaiting plugging that have been prioritized according to the environmental threats they pose. Plugging all orphan wells would be an extremely large financial burden on the states. Today's petroleum prices provide an incentive to identify and address orphan wells because the revenue to the states has increased and this, combined with modern technology, has enabled the states to respond to the need more aggressively.

States should be commended for their efforts to date, both in finding and remediating orphan wells. The states have also set up regulatory structures that require adequate bonding or insurance coverage, in an effort to prevent the likelihood of orphan wells in the future.

It must, however, be noted that while states have

established plugging funds, those funds are insufficient to address timely cleanup of the remaining orphan wells. Therefore, it's essential that the states, along with IOGCC, continue to explore innovative and financial means to plug all existing orphan wells. As unremediated orphan wells can cause as much damage to precious petroleum resource reserves as to the surface environment or to water resources, assistance from many directions is needed to help the states in their efforts.

An orphan oil and gas well plugging program for the states was established in Section 349 (g) and (h) of the Energy Policy Act of 2005. That legislation authorizes up to \$20 million annually in federal matching funds to help states plug their abandoned wells. However, to date no money has been appropriated. IOGCC will continue to present the cause and to educate Congress about the issues and costs related to orphan wells with the goal of seeing this legislation meet its intended goal to help the states address this significant environmental issue.

IOGCC encourages the states to continue their efforts to plug these orphaned wells in a logical manner, focusing on wells posing the greatest threats. States are encouraged to review the adequacy of financial assurance requirements for operators/owners to ensure future orphan wells will be plugged without public funds.

Still other states have employed creative approaches to find undocumented orphan wells for evaluation and to increase plugging funds. Those stories are presented here in an effort to provide states with access to new approaches that they may find useful. The IOGCC is also conducting a study of the well-closure process in hopes of identifying lower cost materials and processes to stretch limited plugging funds.

Further, both in the states and elsewhere, it is clear that the oil and natural gas industry can be creative and important partners in addressing this significant issue. The IOGCC urges states and industry to continue to work in partnership and to find ways in which to expand that partnership.

DATA TABLES

Figure 10. Plugging Funds Expended: All surveyed states per survey period

<i>*Fields marked with an “*” indicate that no data was reported or available for that survey period</i>				
State	Survey Year	Plugging funds expended	# of wells plugged	Average Cost per Well
Alabama	1992	*	*	*
	1996	*	*	*
	1999	*	*	*
	2006	*	*	*
Alabama Total		*	*	*
Alaska	1992	*	*	*
	1996	*	*	*
	1999	*	*	*
	2006	200,000	5	40,000
Alaska Total		200,000	5	40,000
Arkansas	1992	2,500	3	833
	1996	75,500	8	9,438
	1999	110,000	20	5,500
	2006	990,000	178	5,562
Arkansas Total		1,178,000	209	5,636
California	1992	2,887,000	179	16,128
	1996	1,585,000	70	22,643
	1999	4,543,000	431	10,541
	2006	8,390,282	451	18,604
California Total		17,405,282	1,131	15,389
Colorado	1992	132,193	2	66,097
	1996	454,199	30	15,140
	1999	867,085	104	8,337
	2006	1,671,944	82	20,390
Colorado Total		3,125,421	218	14,337
Florida	2006	650,000	9	72,222
Florida Total		650,000	9	72,222
Illinois	1992	75,000	12	6,250
	1996	1,025,000	243	4,218
	1999	1,800,000	783	2,299
	2006	10,100,000	2,162	4,672
Illinois Total		13,000,000	3,200	4,063
Indiana	1992	75,000	*	*
	1996	125,000	9	13,889
	1999	340,000	73	4,658
	2006	361,297	25	14,452
Indiana Total		901,297	107	8,423

<i>*Fields marked with an “*” indicate that no data was reported or available for that survey period</i>				
State	Survey Year	Plugging funds expended	# of wells plugged	Average Cost per Well
Kansas	1992	*	*	*
	1996	1,528,000	1,250	1,222
	1999	6,983,000	1,892	3,691
	2006	13,366,630	4,542	2,943
Kansas Total		21,877,630	7,684	2,847
Kentucky				
	1992	619,000	432	1,433
	1996	704,150	204	3,452
	1999	1,726,850	804	2,148
	2006	3,557,034	1,603	2,219
Kentucky Total		6,607,034	3,043	2,171
Louisiana	1992	153,606	6	25,601
	1996	3,246,394	121	26,830
	1999	14,431,000	627	23,016
	2006	27,169,000	974	27,894
Louisiana Total		45,000,000	1,728	26,042
Michigan	1992	1,110,900	50	22,218
	1996	1,133,000	50	22,660
	1999	6,789,100	100	67,891
	2006	4,644,874	47	98,827
Michigan Total		13,677,874	247	55,376
Mississippi	1992	*	*	*
	1996	300,000	30	10,000
	1999	500,000	55	9,091
	2006	3,380,000	255	13,255
Mississippi Total		4,180,000	340	12,294
Missouri	1992	22,000	25	880
	1996	21,000	40	525
	1999	22,500	69	326
	2006	23,890	8	2,986
Missouri Total		89,390	142	630
Montana	1992	725,000	9	80,556
	1996	1,180,000	46	25,652
	1999	3,180,000	137	23,212
	2006	3,291,481	315	10,449
Montana Total		8,376,481	507	16,522
Nebraska	1992	*	*	*
	1996	*	*	*
	1999	*	*	*
	2006	35,000	5	7,000
Nebraska Total		35,000	5	7,000

<i>*Fields marked with an “*” indicate that no data was reported or available for that survey period</i>				
State	Survey Year	Plugging funds expended	# of wells plugged	Average Cost per Well
New Mexico	1992	*	*	*
	1996	*	*	*
	1999	556,536	43	12,943
	2006	6,130,113	424	14,458
New Mexico Total		6,686,649	467	14,318
New York	1992	83,000	3	27,667
	1996	250,000	6	41,667
	1999	250,000	6	41,667
	2006	250,000	48	5,208
New York Total		833,000	63	13,222
North Dakota	1992	50,000	*	*
	1996	63,000	3	21,000
	1999	226,000	11	20,545
	2006	225,000	8	28,125
North Dakota Total		564,000	22	25,636
Ohio	1992	11,200,000	1,127	9,938
	1996	11,200,000	1,127	9,938
	1999	12,256,000	1,372	8,933
	2006	26,000,000	1,739	14,951
Ohio Total		60,656,000	5,365	11,306
Oklahoma	1992	889,000	292	3,045
	1996	2,360,762	514	4,593
	1999	5,970,000	1,455	4,103
	2006	3,963,564	1,497	2,648
Oklahoma Total		13,183,326	3,758	3,508
Pennsylvania	1992	814,000	38	21,421
	1996	964,000	43	22,419
	1999	814,000	57	14,281
	2006	12,755,310	1,555	8,203
Pennsylvania Total		15,347,310	1,693	9,065
Texas	1992	21,858,000	5,402	4,046
	1996	14,216,158	8,421	1,688
	1999	30,823,842	15,476	1,992
	2006	11,293,316	11,848	953
Texas Total		78,191,316	41,147	1,900
Utah	1992	*	*	*
	1996	106,000	14	7,571
	1999	283,000	46	6,152
	2006	714,594	22	32,482
Utah Total		1,103,594	82	13,458

Fields marked with an “” indicate that no data was reported or available for that survey period				
State	Survey Year	Plugging funds expended	# of wells plugged	Average Cost per Well
Virginia	1992	*	*	*
	1996	*	*	*
	1999	250,000	11	22,727
	2006	150,000	13	11,538
Virginia Total		400,000	24	16,667
West Virginia	1992	102,000	26	3,923
	1996	258,000	39	6,615
	1999	205,800	22	9,355
	2006	1,049,227	41	25,591
West Virginia Total		1,615,027	128	12,617
Wyoming	1992	*	*	*
	1996	82,600	6	13,767
	1999	237,400	64	3,709
	2006	4,573,000	233	19,627
Wyoming Total		4,893,000	303	16,149
Grand Total		319,776,631	71,627	4,464

Figure 11. Securities Permitted by Surveyed States

State	Date Security First Required	Modified Since 2000 Survey	Regulatory Authority Adjustment Permitted	Separate Site Restoration Bond	CD	Cash	Certificate of Insurance	Consolidated Financial Fund	Escrow Account	Financial Statements	Letter of Credit	Liens	Security Interest	Surety and/or Performance Bonds
Alabama	1945		•											•
Alaska	1958		•	•	•						•			•
Arizona	1959		•	•	•	•								•
Arkansas	1983		•		•	•					•			•
California	1931				•	•								•
Colorado	1951		•	•	•	•	•	•	•	•		•	•	•
Florida	1946	•	•		•	•			•					•
Illinois	1939		•		•					•				•
Indiana	1947	•			•	•								•
Kansas	1982	•				•				•	•	•		•
Kentucky														
Louisiana	2000	•	•		•						•			•
Maryland	1957				•	•					•			•
Michigan	1931		•		•	•				•	•			•

State	Date Security First Required	Modified Since 2000 Survey	Regulatory Authority Adjustment Permitted	Separate Site Restoration Bond	CD	Cash	Certificate of Insurance	Consolidated Financial Fund	Escrow Account	Financial Statements	Letter of Credit	Liens	Security Interest	Surety and/or Performance Bonds
Mississippi	1992		•			•					•			•
Missouri	1966		•		•						•			•
Montana	1954		•		•					•				•
Nebraska	1959		•		•	•								•
Nevada	1954		•		•	•								•
New Mexico	1935	•		•		•					•		•	•
New York	1963				•	•					•			•
North Dakota	1941					•								•
Ohio	1963				•	•				•	•			•
Oklahoma	1922				•	•				•	•			•
Pennsylvania	1985				•	•								•
Tennessee	1943				•	•								•
Texas	1983					•					•			•
Utah	1955	•			•	•					•			•
Virginia	1955				•	•								•
West Virginia	1963				•	•		•			•			•
Wyoming	1951				•	•					•			•

Figure 12. State security or financial assurance requirements: Single wells

State	Security	Depth (feet) or Criteria	Conditions
Alabama	MIN \$5,000 MAX \$50,000		
Alaska	MIN \$100,000		Single well bonds allowed for estimated cost of P & A if less than \$100,000
Arizona	MIN \$10,000 MAX \$20,000	< 10,000 > 10,000	
Arkansas	MIN \$3,000 MAX \$15,000		
California	MIN \$15,000 \$20,000 MAX \$30,000	< 5,000 5,001 - 9,999 > 10,000	
Colorado	\$5,000		
Florida	\$50,000 \$100,000	< 9,000 > 9,000	\$100,000 / producer \$200,000 / producer
Illinois	\$1,500 \$3,000	< 2,000 > 2,000	
Indiana	\$2,500		
Kansas	\$1		Multiplied times the aggregate depth for all wells drilled or operated
Louisiana	\$1 per foot \$2 per foot \$3 per foot	< 3,000 3,001 - 9,999 > 10,000	
Maryland	MIN \$100,000		
Michigan	MIN \$10,000 MAX \$30,000		
Mississippi	\$10,000 \$15,000 \$30,000 \$50,000	< 10,000 10,001 - 16,000 16,001 - 20,000 > 20,000	
Missouri	\$1,000 \$2,000 \$3,000 \$4,000 \$4,000	0 - 500 501 - 1,000 1,001 - 2,000 2,001 - 5000 + \$1/ ft > 5,001	
Montana	\$1,500 \$5,000 \$10,000	< 2,000 2,001 - 3,500 > 3,500	
Nebraska	\$5,000		
Nevada	\$10,000		
New Mexico	\$5,000 \$10,000	+ \$1/ft + \$1/ft	Major producing counties Other counties

State	Security	Depth (feet) or Criteria	Conditions
New York	\$2,500 \$5,000 Varies	< 2,500 2,501 - 6,000 > 6,000	Security covers plugging & restoration Anticipated costs
North Dakota	\$20,000		Wells drilled to a total depth of 2,000 feet may be bonded in a lesser amount upon approval
Ohio	\$5,000		
Oklahoma	Varies		As established by licensed plugger
Pennsylvania	\$2,500		
Tennessee	\$5,000		
Texas	\$2 per foot		Total aggregate depth
Utah	\$15,000 \$120,000	< 1,000 > 1,000	
Virginia	\$10,000	+ \$2,000 / per acre	
West Virginia	\$5,000		
Wyoming	\$10,000 \$20,000	< 2,000 > 2,000	

Figure 13. State security or financial assurance requirements: Blanket bonds

State	Blanket Bond	# of Wells	Amount / Conditions
Alabama	\$100,000		
Alaska	Minimum \$200,000		
Arizona	\$25,000 \$50,000 \$250,000	10 10 – 50 > 50	Can be required on state leases
Arkansas	\$25,000 \$50,000 \$100,000	< 50 > 50 > 100	
California	\$100,000 \$250,000 \$1,000,000	< 50 > 50 All wells	
Colorado	\$30,000 \$100,000	< 100 > 100	For surface: \$2,000 for non-irrigated land \$5,000 for irrigated land \$25,000 blanket statewide assurance
Florida	\$1,000,000	10	
Illinois	\$25,000 \$50,000 \$100,000	< 25 26 – 50 > 50	
Indiana	\$45,000		
Kansas	MIN \$15,000 MAX \$45,000	Varies according to depth	

State	Blanket Bond	# of Wells	Amount / Conditions
Louisiana	\$25,000 \$125,000 \$250,000	< 10 11 – 99 > 100	
Maryland	MAX \$500,000		
Michigan	MIN \$100,000 MAX \$250,000		One performance bond covers all wells
Mississippi	\$100,000		
Missouri	\$20,000 \$30,000	< 50 (0 -800 ft) < 15 (801 – 1,200 ft)	
Montana	\$50,000		
Nebraska	\$25,000		
Nevada	\$50,000		
New Mexico	\$50,000		
New York	\$25,000 - \$100,000 \$40,000 - \$150,000		
North Dakota	\$50,000 \$100,000	< 10 > 10	The \$50,000 blanket bond is limited in its coverage to contain no more than three unplugged dry holes, plugged wells with site not reclaimed, and/or abandoned wells; The \$100,000 bond is limited to six
Ohio	\$15,000 \$30,000		\$30,000 bond for financial statements
Oklahoma	\$25,000 \$50,000		Net worth for financial statement
Pennsylvania	\$25,000		Security covers drilling, plugging, water supply, replacement and restoration
Tennessee	\$20,000		Required when the landowner/lessee is not party to the leasing agreement
Texas	\$25,000 \$50,000 \$250,000	1 – 10 11 – 99 >100	For reclamation plants only; in the amount required to close the facility
Utah	\$15,000 \$30,000 \$60,000	1000 – 3000 3,001 – 10,000 >10,000	Security covers drilling, plugging, water supply, replacement and restoration
Virginia	\$25,000 \$50,000 \$75,000 \$100,000	1 – 15 16 – 30 31 – 50 > 50	
West Virginia	\$50,000		
Wyoming	\$75,000		Additional amount may be required for dormant wells or pits; Agency requires bonding for some pits

Figure 14. Salvage Valuation

State	Valuation methodology	Anecdotal Information
Arkansas	Competitive bid by plugging contractors	Value of well site production equipment is used to offset plugging cost
California	Competitive bid by plugging contractors	Value of well site production equipment is used to offset plugging cost
Colorado	Competitive bid by plugging contractors	
Illinois	Current market value	Surface equipment value estimated only
Indiana	Competitive bid by resellers	State agency attempts to locate an interested operator to produce wells; Wells that cause environmental damages are plugged
Kansas	Sealed bid	Wells must be determined to have no economic value before state plugging. Proceeds from salvage are deposited in the Abandoned Well Plugging Fund (approx \$60,000/year)
Kentucky	Competitive bid by plugging contractors	
Louisiana	Competitive bid by plugging contractors	Bidders separately identify and place value on each piece of salvage equipment on a well-by-well basis
Michigan		Any funds from salvage are returned to the Orphan Well Fund. For the 2006 plugging season, the value of salvage was \$160,845.
Mississippi	Competitive bid by plugging contractors	
Nebraska		Nebraska has typically not included the value in a cost estimate to plug a well. Contractors have been selected on the basis of their ability to do the required work and their price sheets and not a firm bid. Cost of abandonment is based on time worked. Wells are evaluated to determine a level of interest by other operators who may wish to bond and utilize the wells. The companies performing the plugging work have sold the equipment and retained 10% of the sales price. The remaining 90% of the value has been credited back on the final invoice for the plugging of the wells.
North Dakota	Current market value	
Ohio	Current market value	ORC 1509.072 states that this has to be done. Rarely, is there any equipment or asset value. Salvage value is deducted from the contract price by plugging contractor.
Oklahoma	Competitive bid by plugging contractors	
Utah	Current market value	A full procedure and cost analysis is prepared for each well prior to bidding out the projects. Aside from a brief review of production history, reserves are not fully estimated. However, operators in the vicinity are notified that the well is going to be plugged and have the option to take over the well. Salvage value, if any is included in the cost analysis and would be considered as part of a responsible bid.

STATE SUMMARIES

STATE SUMMARY INTRODUCTION

States have statutory authorities and regulatory mechanisms to address orphan wells. While the IOGCC provided a definition for “orphan well” for purposes of this study, state definitions vary and are included in this category. Some states differentiate between abandoned and orphaned wells, and those definitions are also reflected in this category. Also included, is the specific information from the individual states concerning the date of establishment of the state regulatory program, the authorities used to regulate abandoned, idle, and orphan wells, statutory or regulatory definitions, and changes or improvements in programs. A synopsis of state authorities and definitions is included in Appendices A through FF.

Over the course of the four survey periods, some elements begin to emerge as points of note. In the first survey year, 1992, only 17 states reported any plugging activity. Texas reported plugging 5,402 wells, followed by Ohio at 1,127 and Kansas with 1,060. Kentucky reported plugging 432 and Oklahoma, 292. The rest of the numbers reported were less than 50 and most below 30. Waiting lists were obviously random in most cases and the average costs to plug were reported at a high for Montana of \$80,000 and a low for Arkansas of \$833, with most reporting within the range of 16,000 to 27,000. By the second survey period reported in 1996, 22 states reported plugging activity and the leaders in volume remained the same. The waiting lists were clearly becoming more defined, with eight states reporting zero, six reporting 30 or less, six states reporting waiting lists numbering in the thousands and five in the hundreds. Generally costs to plug went up and began to show more diversity. The new leader in high costs was Colorado at \$125,038 (a standing record) and the low was Missouri at \$1,075. Most of the reporting states clustered into three cost ranges: \$2,000 to \$4,000, \$9,000 to \$17,000 and \$22,000 to \$25,000.

In the third reporting period, the study of 1999 showed that only four states reported no plugging activity. Texas and Kansas remained the first and second leader in plugging activity reporting 15,476 and 1,892 wells plugged respectively. Third place turned into a cluster of states: Oklahoma (1,455), Kentucky (1,440), Ohio (1,372) and Illinois (1,038). Waiting lists also moved up in numbers with only six states reporting zero wells, five reporting 20 or less, nine reporting in the hundreds and five reporting in the thousands. That period’s leader in average plugging costs was New York at \$41,667 and the low was Missouri at \$949. Nine states reported costs in the range of \$2,000 to \$6,000, four states reported cost ranges of

\$13,000 to \$19,000 and five reported costs above \$22,000.

For this most current study period, only three states reported no plugging activity. Texas and Kansas retained their leadership positions, 10,910 and 4,542 respectively. Only two states clustered in the third position, Illinois at 3,200 and Kentucky at 3,043. The waiting lists, however, continued to develop with only two reporting no wells, ten states reported in the thousands and six reported in the hundreds. Michigan reported the high in average plugging costs at \$55,376, with Alaska a strong second at \$40,000. The low cost state was Tennessee at \$1,035. The ranges became somewhat more blurred with a defined clump reporting in the \$1,000 to \$5,000 range, but almost a steady progression from \$7,000 up to 28,000.

Appendix A: Alabama

Regulatory Authority

State Oil and Gas Board
PO Box 869999
Tuscaloosa, AL 35486-6999
www.ogb.state.al.us

Background

Regulation of oil and gas wells in Alabama began in 1945 through legislation establishing the State Oil and Gas Board. The act provided the authority to regulate oil and gas wells, protect ground water, and provide for plugging, abandonment, and bonding. State Oil and Gas Board regulations were promulgated effective Oct. 1, 1946, to regulate these activities. Section 917-6 of the Code of Alabama provides for regulation of oil and gas wells by requiring the “drilling, casing and plugging of wells to be done in such a manner as to prevent the escape of oil and gas out of one stratum to another,” and “to prevent the pollution of fresh water supplies by oil, gas or salt water.”

Alabama has established a Well Plugging Fund to collect and disburse fees for the purpose of plugging coalbed methane gas wells. The fund will be used when the failure to plug a well poses a threat to the environment or to the public health, safety or welfare.

State Plugging Efforts

Currently, Alabama does not have a plugging fund dedicated to orphan wells. State plugging funds are dedicated to plugging coalbed methane gas wells.

Sources of Plugging Funds

Fee Permit fee

Definitions

Abandoned Well

Alabama statutes define an abandoned well as one that has not been used for six consecutive months and cannot be operated, whether because it is a dry hole or production has ceased, or operations have not been conducted, or for other reasons.

Orphan Well

Alabama does not statutorily define an orphan well, per se, but addresses abandoned wells.

Temporarily Abandoned Well

A temporarily abandoned well is statutorily defined as a well currently not producing oil and/or gas that has been approved for future utility by the state supervisor.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Wells</i>
Base	\$100,00		

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Maximum	\$50,000		
Minimum	\$5,000		

Statutory Authorities

Plugging Fund

Coalbed Methane Gas Plugging Fund: Ala. Code § 9-17-133

Authority to Regulate

Ala. Code 1975 § 9-17-6

Definitions

Alabama Oil & Gas Regulations § 400-1-1-05

Security or Financial Assurance

Date Security First Required:	1945
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☒
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☐
Cash	☐
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☐
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix B: Alaska

Regulatory Authority

Alaska Oil & Gas Commission
333 West Seventh Avenue, Suite 100
Anchorage, AK 99501-3935
www.state.ak.us/local/

Background

The Alaska Oil and Gas Conservation Commission began its regulation of oil and gas wells on Oct. 1, 1958. AS 31.05.030 describes the commission's authority to regulate oil and gas wells in the state. Plugging and abandonment regulations began in 1958 and were revised in 1986 and 1999. Ground water protection began generally in 1958. Authority to take primacy under the Safe Drinking Water Act began in 1984 and was revised in 1986 and 1999.

State Plugging Efforts

Sources of Plugging Funds

Public Operating budget

Definitions

Abandoned Well

An abandoned well is defined as a well plugged in accordance with 20 AAC 25.112, which dictates the setting of subsurface and surface plugs.

Temporarily Abandoned Well

Alaska does not use the term temporarily abandoned well, but rather uses the terms "suspended" and "shut-in" in the state's regulations. In Alaska, a suspended well is a well plugged in accordance with 20 AAC 25.110 with a reserved option to re-enter and re-drill the well or complete the well. A shut-in well is defined as a well where the surface, wellhead, or subsurface valves have been closed to halt flow from or into the well, with the completion interval remaining open to the tubing below the closed valves.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Wells</i>
Minimum	\$200,00		

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Maximum	\$100,000		
Single well bonds allowed for estimated cost of P & A if less than \$100,000			

Statutory Authorities

Abandoned Wells

20 AAC 25.105 and 20 AAC 25.112

Authority to Regulate

Alaska Statute Title 31 Chap 5 §31.05.030

Security or Financial Assurance

Date Security First Required:	1958
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☒
Separate Site Restoration Bond	☒

Types of Security Bonds Allowed

CD	☒
Cash	☐
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☒
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix C: Arizona

Regulatory Authority

Arizona Geological Survey
416 West Congress Street, Suite 100
Tucson, AZ 85701
www.azgs.state.az.us

Background

The Arizona Oil and Gas Conservation Commission was established in 1959 to administer the Conservation Act of 1951, which was expanded in 1978 to include regulation of enhanced recovery, disposal and storage wells. As of July 1991, the Arizona Geological Survey provides staff support to the commission to administer and enforce the laws relating to the conservation of oil and gas. Rules promulgated pursuant to statutory authority are reviewed every five years and new rules are adopted, outdated rules repealed, and existing rules amended as necessary to be consistent with applicable federal law, and to account for technological advances and currently accepted practices in the regulated industry. In 1995, Arizona amended its laws to allow the commission to forfeit the bond of owners who fail to properly plug each dry or abandoned well and to sue them for plugging costs in excess of the bond amount. The Arizona Department of Water Resources has authority over water wells, and the Arizona Department of Environmental Quality has authority over Class I, III, IV, and V injection wells.

State Plugging Efforts

Arizona has no orphan wells, and therefore has no need for plugging efforts relative to such wells.

Definitions

Abandoned Well

An abandoned well is defined as one that is not producing, injecting, or plugged and is not capable of being put to some future beneficial use.

Temporarily Abandoned Well

Arizona defines a temporarily abandoned well as a well that is not producing, injecting, or plugged but might be capable of being put to some future beneficial use.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Minimum	\$25,000		10
Mid	\$50,000		10 - 50
Maximum	\$250,00		> 50

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Maximum	\$20,000	> 10,000	
Minimum	\$10,000	< 10,000	
Can be required on state leases			

Statutory Authorities

Plugging Oil and Gas Wells

27-524(E), and 27-516 (A)(3)

Authority to Regulate

27-515, and 27-516

Security or Financial Assurance

Date Security First Required:	1959
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☒
Separate Site Restoration Bond	☒

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☐
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix D: Arkansas

Regulatory Authority

Oil & Gas Commission
301 Natural Resources Drive, Suite 102
Little Rock, AR 72205
www.aogc.state.ar.us

Background

Arkansas began regulating oil and gas wells in 1939. Required plugging and abandonment procedures were also enacted in 1939, as were efforts for the protection of ground water. The Arkansas Oil and Gas Commission is the state office responsible for enforcing the regulations. A significant revision to the regulations was adopted in 1983 to include bonding or a letter of credit for security purposes. In 1995, the state reduced its bonding

State Plugging Efforts

The Arkansas Abandoned and Orphan Well Plugging Fund was created by statute in 2005. The fund is funded by an annual well fee assessed to operators or wells in the state. The fee generates approximately \$250,000 annually. Prior to the establishment of the plugging fund, abandoned and orphan wells were plugged utilizing funds from the commission operating budget.

Sources of Plugging Funds

Fee Annual operating fee

Definitions

Abandoned Well

Arkansas defines an abandoned well as any well that is not producing, has not received regulatory approval to remain idle or temporarily abandoned and has an unknown or insolvent operator.

Temporarily Abandoned Well

A temporarily abandoned well is a well that has been shut-in due to well bore problems or economic reasons, but has not been plugged.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Minimum	\$25,000	< 50	
Mid	\$50,000	51 - 99	
Maximum	\$100,00	> 100	

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Maximum	\$15,000		
Minimum	\$3,000		

Statutory Authorities

Plugging Fund

Ark. Stat. Ann. § 15-71-115 (2007)

Authority to Regulate

Ark. Stat. Ann. § 15-71-110 (2007), § 15-72-217

Security or Financial Assurance

Date Security First Required:	1983
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☒
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☒
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix E: California

Regulatory Authority

Department of Conservation
801 K. Street MS 20-20
Sacramento, CA 95814
www.consrv.ca.gov/DOG

Background

California began its regulatory program in 1915, which included plugging and abandonment procedures. A ground water protection component was added in 1929. Two years later, the first well-bonding requirements were established. Revisions to update/enhance the statutes and regulations have occurred throughout the history of the program. The California Division of Oil, Gas, and Geothermal Resources is responsible for its maintenance.

State Plugging Efforts

California made major changes to its bonding statutes on Jan. 1, 1999. For individual well bonds, each amount was increased by \$5,000. Amounts are based on depths and come in three increments: wells < 5,000' = \$15,000; wells > 5,000' but < 10,000' = \$20,000; and wells > 10,000' = \$30,000. Blanket bonds are: \$1 million "super" blanket bond covers all wells, including idle wells; \$250,000 covers more than 50 wells, but not idle wells; and \$100,000 covers 50 or fewer wells, but not idle wells.

Regarding orphan wells, the state has an innovative orphan well adoption program, which allows for an opportunity to bring wells back into production. The division maintains a list of orphan wells that are available for adoption. This program allows prospective operators to enter into a three-way agreement to test an orphan well for up to 90 days without incurring any liability for plugging the well. If the test is successful, the prospective operator can adopt the well by posting a bond and becoming its permanent operator. If the test is unsuccessful, the prospective operator can walk away from the agreement with no liability incurred.

Sources of Plugging Funds

<i>Fee</i>	Idle well fee
<i>Tax</i>	Production assessment

Definitions

Abandoned Well

The state defines an abandoned well as one properly plugged, with the site location restored, and all reports filed.

Orphan Well

In California, an orphan well is defined as a well that has been deserted and has no viable operator or owner. California uses the term "idle-deserted" to define a well with no operator responsible for its plugging and abandonment. California also defines an "acute orphan well" as a well that could pose an immediate danger to life, health, or natural resources, but with no viable operator responsible for plugging and abandoning the well.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Minimum	\$100,00	< 50	
Mid	\$250,00	> 50	
Maximum	\$1,000,0	All wells	

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Maximum	\$30,000	> 10,000	
Mid	\$20,000	5,001 - 10,000	
Minimum	\$15,000	< 5,000	

Statutory Authorities

Authority to Regulate

Public Resources Code
(PRC) 3106, 3237, 3250, 3260, and 3263]; Idle Deserted Wells – [PRC 3237 and 3251

Security or Financial Assurance

Date Security First Required:	1931
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☐
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☐
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix F: Colorado

Regulatory Authority

Oil & Gas Conservation Commission
1120 Lincoln Street, Suite 801
Denver, CO 80203-2136
www.oil-gas.state.co.us

Background

The Colorado Oil and Gas Conservation Commission (COGCC) began regulating oil and gas wells in 1951. Regulation of ground water protection and plugging and abandonment procedures also began that year. The commission has the authority to regulate the drilling, production and plugging of oil and gas related wells and all other operations for the production of oil or gas. COGCC also controls the shooting and chemical treatment of wells, well spacing, and all oil and gas operations to prevent and mitigate significant adverse environmental impacts on any air, water, soil or biological resources resulting from oil and gas operations to the extent necessary to protect public health, safety, and welfare; taking into consideration cost-effectiveness and technical feasibility.

In 1989, an amendment to the Water Quality Control Act designated the COGCC as an implementing agency for ground water standards and classifications. In 1994, legislation required the commission to balance promotion of oil and gas development with the protection of public health, safety and welfare. This legislation also expanded the types of financial surety accepted. In 1995, the commission began requiring mechanical integrity testing on any well idle for more than two years.

State Plugging Efforts

Colorado's source of plugging comes from a mill levy imposed on the market value of all oil and gas produced, saved, sold or transported from the field. The COGCC receives an annual appropriation of \$220,000 that is dedicated to plugging and reclaiming orphaned wells out of these funds. The uncommitted balance of this fund could be appropriated to plug additional wells or respond to emergencies.

Sources of Plugging Funds

Tax Excise tax

Definitions

Abandoned Well

An abandoned well is a well that is properly abandoned per COGCC specifications outlined in COGCC Rule 319 a.

Orphan Well

An orphaned well is defined as a well where no operator can be located. An inactive well (for financial assurance

purposes) is defined as any well from which no production has been sold for a period of 12 consecutive months; any well that has been temporarily abandoned for a period of six consecutive months; or any injection well which has not been utilized.

Temporarily Abandoned Well

A temporarily abandoned well is incapable of production or injection without the addition of one or more pieces of wellhead or other equipment, including: valves, tubing, rods, pumps, heater-treaters, separators, dehydrators, compressors, piping, or tanks.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Minimum	\$30,000	< 100	
Maximum	\$100,00	> 100	
Other	\$25,000	Surface	Blanket
Other	\$5,000	Surface	Irrigated land
Other	\$2,000	Surface	Non-irrigated

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Base	\$5,000		

Statutory Authorities

Plugging Fund

C.R.S. 34-60-122

Authority to Regulate

C.R.S. 34-60-106 (2)]; Abandonment – [Rule 319 a]

Security or Financial Assurance

Date Security First Required:	1951
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☒
Separate Site Restoration Bond	☒

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☒
Consolidated Financial Fund	☒
Escrow Account	☒
Financial Statements	☒
Letter of Credit	☐
Liens	☒
Security Interest	☒
Surety and/or Performance Bonds	☒

Appendix G: Florida

Regulatory Authority

Department of Environmental Protection
903 West Tennessee Street, MS 720
Tallahassee, FL 32304-7700
www.dep.state.fl.us/geology

Background

Florida began regulation of oil and gas wells in 1945 and has made revisions to its regulations in 1962, 1972, 1981, 1989 and 1993. Ground water protection and plugging and abandonment procedures began in 1946. The Florida Geological Survey has responsibility for regulation of oil and gas wells in the state.

State Plugging Efforts

Florida has established a Minerals Trust Fund to assist in plugging of abandoned wells. These funds are intended for use when the operator cannot or will not correct the violations within a reasonable time.

Definitions

Abandoned Well

An abandoned well is one that has been permanently plugged and forsaken.

Temporarily Abandoned Well

In Florida, temporarily abandoned wells are those with existing perforations plugged that could be re-entered.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Base	\$1,000,0	10	

Single Well Securities

<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Maximum	\$100,000 \$200,000 / producer	> 9,000
Base	\$50,000 \$100,000 / producer	< 9,000

Statutory Authorities

Plugging Fund

Minerals Trust Fund: Florida Statutes, Chapter 376.40

Authority to Regulate

Florida Statutes, Chapter 377, Part I, Florida Administrative Code, Rule 62C-26.008, F.S.A. § 376.40

Security or Financial Assurance

Date Security First Required:	1946
Modified Since 2000 Survey	☒
Regulatory Authority Adjustment	☒
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☒
Financial Statements	☐
Letter of Credit	☐
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix H: Illinois

Regulatory Authority

Department of Natural Resources
One Natural Resources Way
Springfield, IL 67206
www.dnr.state.il.us/mines/dog

Background

The Illinois Oil and Gas Act was adopted in 1939. It provides the Department of Natural Resources, Division of Oil and Gas in the Office of Mines and Minerals with the authority to define and regulate idle, orphan and temporarily abandoned wells. While the measure generally specified the protection of ground water, specific surface casing requirements were not mandated until 1984. Plugging requirements, which have been modified since the adoption of the law, have been in place since its passage in 1939.

No significant revision occurred until 1988, when authority for the regulation of oil and gas wells was removed from the State Mining Board and given to the director of the Department of Mines and Minerals (part of the Illinois Department of Natural Resources), effective July 1, 1995. In 1989, the Division of Oil and Gas was given enforcement authority in the form of administrative orders, including the issuance of civil penalties for violations. Bonding requirements for wells were eliminated in 1990 and replaced with an annual well fee, thus creating the State Plugging and Restoration Program. In 1997, the act was amended to create the Landowner Grant Program to plug abandoned wells and to establish salvage procedures for abandoned production equipment. The department uses this program to offset plugging costs. Over the last nine years, the oil and gas rules have undergone 24 amendments, including: revision of temporary abandonment; plugging and mechanical integrity testing rules for Class II wells; revision of permitting requirements of production wells and Class II Injection wells and revised rules for the operation and construction of production and Class II wells; rules addressing the handling, transportation, and disposal of exploration and production (E&P) waste; and the elimination of produced water pits.

In accordance with the oil and gas rules, all idle wells must be reported to the department and put on temporary abandoned status if they have been idle for more than two years. Operators, which do not report idle wells to the department, are issued a notice of violation for failure to request temporary abandoned status. If the well is not

granted temporarily abandoned status, the well is ordered plugged. If no operator for the well can be located, after notice and hearing, the unit is placed into the State Plugging and Restoration Program.

State Plugging Efforts

Statutes in Illinois require the department to annually publish a financial report describing the income, expenditures, and obligations of the Underground Resources Conservation Enforcement Fund and the Plugging and Restoration Fund, including the number of orphan wells identified and the status of closure of these wells.

In the case of orphan wells, the State of Illinois files a lien for all fees due and for all funds expended by the department to plug, replug, repair or restore the site of the orphan well. The lien extends to the entire owners' and operators' interest in the well and to all equipment used in connection with the operating of the well, as well as to the entire acreage included in the drilling unit or units. The lien created in the case of an orphan well is prior and superior to any mortgage or other lien except for the lien of local property taxes.

The department may elect to plug, replug, repair, or restore the well site of any orphan well, but only after a determination by the department, in accordance with its rules, that the well is orphaned. In cases where no permittee can be identified or located and no contributions have been made to the fund attributable to the operation of the well, expenditures are limited to amounts attributable to the fund's interest earnings or from amounts in the fund other than permittee contributions, unless those amounts are otherwise restricted.

Sources of Plugging Funds

Fee	Annual operating fee

Definitions

Orphan Well

Illinois defines a well as orphan if its bond has not been paid for the past two years, no oil or gas has been produced in two years, and no owner can be identified by the state. A well that has been drilled for purposes other than those for which a permit is required can also be considered an orphan

well if it serves as a conduit for oil or salt water intrusions into fresh water zones or onto the surface.

Temporarily Abandoned Well

A temporarily abandoned well is a well that has been inactive for more than two years and has been temporarily abandoned in accordance with state rules.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Minimum	\$25,000	< 25	
Mid	\$50,000	26 – 50	
Maximum	\$100,00	> 50	

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Maximum	\$3,000		> 2,000
Base	\$1,500		< 2,000

Statutory Authorities

Plugging Oil and Gas Wells

Orphan Well Plugging: 225 ILCS 725/1.2; 19.5; 19.6; 19.8

Definitions

225 ILCS 725/1

Authority to Regulate

225 ILCS 725/1, 225 ILCS 725/1

Security or Financial Assurance

Date Security First Required:	1939
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☒
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☐
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☒
Letter of Credit	☐
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix I: Indiana

Regulatory Authority

Department of Natural Resources
402 West Washington Street Room 293
Indianapolis, IN 46204
www.in.gov/dnr/dnroil

Background

Regulation of oil and gas wells began in 1947 under the responsibility of the Indiana Department of Natural Resources, Division of Oil and Gas. Statutes provide for placing a well in temporarily abandoned status, enabling the DNR to require (after five years) that wells demonstrate mechanical integrity, or be plugged or recased. Significant revisions were made in 1985 in the bonding and UIC programs. In 1999, a new rule was promulgated which provided for alternate tests for verifying the integrity of temporarily abandoned wells. The rule also allowed the DNR to consider future value of wells in granting a second term of temporary abandonment.

State Plugging Efforts

Indiana's primary source of funding for their plugging fund comes from an annual fee paid by operators for each of their producing wells (approximately \$230,000 per year) and civil penalties (approximately \$30,000-\$50,000 per year). Indiana always searches for an interested operator to produce wells when possible, but immediately plug wells that cause environmental damages.

Sources of Plugging Funds

<i>Fee</i>	Annual operating fee
<i>Fine</i>	Civil penalties

Definitions

Abandoned Well

Abandoned well is defined as one that has been permanently plugged.

Orphan Well

Indiana defines orphan wells as units that are not producing and for which no financially responsible party exists.

Temporarily Abandoned Well

Indiana officially defines a temporarily abandoned well as a well that has approval not to produce oil or natural gas and to delay plugging.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Base	\$45,000		

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Base	\$2,500		

Statutory Authorities

Authority to Regulate

Plugging and Abandonment: IC 14-37-8-1

Authority to Regulate

IC 14-37-7

Security or Financial Assurance

Date Security First Required:	1939
Modified Since 2000 Survey	☒
Regulatory Authority Adjustment	☐
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☐
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix J: Kansas

Regulatory Authority

Kansas Corporation Commission
130 South Market Street, Room 2078
Wichita, KS 67202
www.kcc.state.ks.us

Background

Kansas had plugging authority in place in 1933. However, for practical purposes, regulation of oil and gas wells by the Kansas Corporation Commission began in 1935. Ground water protection regulations that related to injection wells or ponds were in place in 1935 and enforced by the Kansas Department of Health and Environment through 1986, and by the Kansas Corporation Commission (KCC) since that date. Plugging and abandonment procedures were also in place in 1935, but were revised and expanded in 1982. An abandoned well database was begun in 1995. As part of that development, a protocol was established by which abandoned wells are categorized according to their threat to the environment and/or public safety. In 1996, financial assurance requirements were authorized and went into effect on Jan. 1, 1998. The Corporation Commission has the statutory authority, under Chapter 55 of the Kansas Statutes, to cause operators to plug abandoned wells and to remediate or repair abandoned wells prior to plugging. The commission can direct an order to plug an abandoned well toward any party that has had physical control of the well during its existence.

On Feb. 4, 1999, in response to low oil prices and the large numbers of temporarily abandoned wells, the KCC issued a special declaratory order clarifying and focusing filing requirements for such wells. The order excluded from the temporary abandonment application filing process wells that met the following criteria: A) Fully equipped for production of oil or gas, or injection; B). Capable of immediately resuming production of oil or gas, or injection; C) Subject to a valid, continuing oil and gas lease; D) Shut in for less than 365 consecutive days; E) Otherwise in full compliance with all rules and regulations.

State Plugging Efforts

The Abandoned Well Plugging Fund is funded through many different resources including the State General Fund, State Water Plan, federal mineral royalties, KCC

Conservation Fund, salvaged equipment from abandoned well sites and interest. Salvaged equipment from plugging projects is sold through sealed bid processes. Proceeds from salvaged equipment are approximately \$60,000 per year.

Sources of Plugging Funds

<i>Fee</i>	Permit fee
<i>Tax</i>	Production assessment

Definitions

Abandoned Well

An abandoned well is any well that has not been properly plugged and where there is no identifiable owner / licensed operator responsible for the care and control of the well.

Temporarily Abandoned Well

A temporarily abandoned well is one which has been inactive for more than 90 days and which is forsaken for the time being by the operator of record. Such wells are eligible for temporary abandonment status upon the filing of an application with the commission.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Minimum	\$15,000	Varies	
Maximum	\$45,000	Varies	

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Base	\$1	Multiplied times the aggregate depth for all wells	

Statutory Authorities

Plugging Oil and Gas Wells

Chapter 55-166

Authority to Regulate

Chapter 55

Security or Financial Assurance

Date Security First Required:	1982
Modified Since 2000 Survey	☒
Regulatory Authority Adjustment	☐
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☐
Cash	☒
Consolidated Financial Fund	☐
Certificate of Insurance	☐
Escrow Account	☐
Financial Statements	☒
Letter of Credit	☒
Liens	☒
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix K: Kentucky

Regulatory Authority

Department of Natural Resources
PO Box 2244
Frankfort, KY 40602-2244
www.dogc.ky.gov

Security or Financial Assurance

Date Security First Required: ☐
Modified Since 2000 Survey ☐
Regulatory Authority Adjustment ☐
Separate Site Restoration Bond ☐

Background

Regulation of oil and gas wells began in 1960, and the Kentucky Revised Statutes provide the Department of Mines and Minerals, Division of Oil and Gas, the authority to require wells to be drilled, cased, and plugged in a manner to prevent waste, blowouts, cave-ins, seepages, and fires, and to protect correlative rights. Ground water protection regulations began in 1978 through an administrative regulation for protection of freshwater zones. Regulation of plugging and abandonment procedures began in 1961, including regulations for wells drilled through both noncoal-bearing strata and coal-bearing strata. Bonding requirements and penalty provisions were established in 1966 and increased in 1990.

Types of Security Bonds Allowed

CD ☐
Cash ☐
Consolidated Financial Fund ☐
Certificate of Insurance ☐
Escrow Account ☐
Financial Statements ☐
Letter of Credit ☐
Liens ☐
Security Interest ☐
Surety and/or Performance Bonds ☐

State Plugging Efforts

Sources of Plugging Funds

Revenue Forfeited bonds

Definitions

Abandoned Well

An improperly abandoned well is defined as a well that is neither producing nor plugged.

Temporarily Abandoned Well

A temporarily abandoned well is defined as a well shut down for good cause as determined by the state.

Statutory Authorities

Authority to Regulate

Idle Wells: Kentucky Revised
Statutes, Chapter 353.510, 353.550, 353.560

Appendix L: Louisiana

Regulatory Authority

Department of Natural Resources
PO Box 94275
Baton Rouge, LA 70804-9275
www.dnr.state.la.us/cons/consrv.ssi

Background

Act 127, passed in 1912, gave the Louisiana Commission for the Conservation of Natural Resources (which became the Louisiana Department of Conservation in 1916) the authority to regulate the plugging of abandoned wells. In 1924, Act 133 made it illegal to pollute the waterways with salt water, oil and other substances. In 1940, Act 157 was adopted as Title 30 of the Revised Statutes of 1950. Statewide Order No. 29-B passed in 1943, and saltwater disposal well regulations were added in 1961 and amended in 1982 to include federally mandated language under the EPA-approved UIC program. The first commercial facility regulations became law in 1980, and six years later the first oil field pit rules were added.

Regulation of orphan wells is carried out by the Louisiana Department of Natural Resources, Office of Conservation. The Office of Conservation rules are contained in Title 43 of the Louisiana Administrative Code. Statewide order 29-B is currently under review and revision.

State Plugging Efforts

If the responsible party is unable to complete site restoration, and the assistant-secretary declares the site to be orphaned, the Oilfield Site Restoration Fund contributes the balance of the restoration costs for the site.

Sources of Plugging Funds

Tax Production assessment

Definitions

Abandoned Well

An abandoned well is defined as a unit whose use has been permanently discontinued or which is in a state of disrepair such that it cannot be used for its intended purpose or for observation purposes.

Orphan Well

Orphan wells are defined as wells which have been abandoned and require cleanup activities. Wells not in compliance with applicable laws and regulations may also be found to be “orphaned.”

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Minimum	\$25,000		< 10
Mid	\$125,00		11 – 100
Maximum	\$250,00		> 100

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Maximum	\$3	Per foot	> 10,000
Mid	\$2	Per foot	3,001 - 10,000
Base	\$1	Per foot	< 3,000

Statutory Authorities

Plugging Fund

Act 404 of 1993 as amended by Act 297 of 1995

Authority to Regulate

Idle Wells: LSA-R.S. 30:4 and Statewide Order No. 29-B § XIX

Security or Financial Assurance

Date Security First Required:	2000
Modified Since 2000 Survey	☒
Regulatory Authority Adjustment	☒
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☐
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☒
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix M: Maryland

Regulatory Authority

Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230
www.mde.state.md.us

Security or Financial Assurance

Date Security First Required: 1957
Modified Since 2000 Survey ☐
Regulatory Authority Adjustment ☐
Separate Site Restoration Bond ☐

Background

Maryland began regulation of oil and gas wells in 1954, but did not have regulations in place for ground water protection or plugging and abandonment procedures until 1991. The Mining Program, under the Maryland Department of the Environment, is responsible for the regulation of oil and gas wells.

State Plugging Efforts

No plugging fund/no orphan wells

Types of Security Bonds Allowed

CD ☒
Cash ☒
Certificate of Insurance ☐
Consolidated Financial Fund ☐
Escrow Account ☐
Financial Statements ☐
Letter of Credit ☒
Liens ☐
Security Interest ☐
Surety and/or Performance Bonds ☒

Definitions

Abandoned Well

An abandoned well is defined as a well in which there has been failure of the permittee to perform in a manner set forth in the authorized drilling and operating permit and the reclamation plan, or upon revocation of the permit.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Maximum	\$500,00		

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Maximum	\$100,000		

Statutory Authorities

Authority to Regulate

Idle Wells: Environment Article §14-103 Code of Maryland Regulations 08.10.01.06 B

Appendix N: Michigan

Regulatory Authority

Department of Environmental Quality
PO Box 30256
Lansing, MI 48909-7756
www.michigan.gov/deq

Background

Act No. 65 of the Michigan Legislature provided for the issuance of permits and regulation of drilling, and in 1927 created the Office of the Supervisor of Wells in the Geological Survey Division of the Department of Environmental Quality. Act 65 also required casing and sealing of each freshwater, brine, oil or gas formation. Plugging requirements also were introduced in 1927. Specific regulations concerning idle wells occurred in 1939, allowing the supervisor of wells to require the locating, drilling, deepening, redrilling, or casing reopening, sealing, operating, and plugging of wells drilled for oil or gas disposal, and to prevent pollution damage to freshwater, underground resources, neighboring properties, or rights to life. In 1994, Michigan passed legislation creating an orphan well fund for plugging, response activity, or site restoration of orphan oil or gas wells. Bond amounts were changed in 1996 to \$10,000–\$30,000 for an individual well; and \$100,000–\$250,000 blanket bond for multiple wells (up to 100).

State Plugging Efforts

Michigan has an Orphan Well Fund. The Fund supervisor must annually submit to the legislature a list of the oil or gas wells that should be plugged and those at which response activities or site restoration should be performed with money in the fund. The list is compiled in order of priority and accompanied by estimates of total project costs, including internal administration and emergency contingencies.

According to statute, the legislature annually appropriates money from the fund for projects on the prepared list, with priority for sites where there exists an imminent threat to public health and safety.

Sources of Plugging Funds

Tax Production assessment

Definitions

Abandoned Well

An abandoned oil or gas well is defined as a well that has not been plugged promptly after having been drilled as a dry hole, or has not been used for its intended purpose during 12 consecutive months without authorization.

Orphan Well

An orphan well is an abandoned or improperly closed well for which no owner or operator is known, or for which all owners or operators are insolvent. Michigan is able to use Orphan Well funds to correct conditions that are determined to be an imminent threat to public safety even if the well is not an orphan.

Temporarily Abandoned Well

A temporarily abandoned well is defined as a unit that has received permission from the Supervisor to remain unplugged for more than 12 consecutive months.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Minimum	\$100,00		
Maximum	\$250,00		
One performance bond covers all wells			

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Maximum	\$30,000		
Minimum	\$10,000		

Statutory Authorities

Plugging Fund

Orphan Well Fund: M.C.L.A. 324.61604

Authority to Regulate

Part 615

Security or Financial Assurance

Date Security First Required:	1957
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☒
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☒
Letter of Credit	☒
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix O: Mississippi

Regulatory Authority

Mississippi Oil & Gas Board
2257 Southwood Road
Jackson, MS 39211
www.ogb.state.ms.us

Background

Regulation of oil and gas wells in Mississippi began in 1948 with the establishment of the State Oil and Gas Board. § 53:1-17 of the Mississippi Code gives the board jurisdictional authority to enforce all laws relating to the conservation of oil and gas. Statewide rules were adopted in 1951, and the plugging rules, adopted in 1948 were revised in 1981. Ground water protection rules adopted in 1948 were revised in 1981 and 1989. Requirements for the financial responsibility of operators were established in 1992.

State Plugging Efforts

Mississippi provides funds to plug orphan wells only when the Oil and Gas Conservation Fund exceeds the fiscal year's estimated budget by at least \$200,000. The statute states that in the event that the Oil and Gas Conservation Fund contains an amount greater than the current fiscal year's estimated budget plus \$200,000, the amount of that excess may be used at the board's discretion, to plug any oil or gas well, including any Class II well which has been determined by the board to represent an eminent threat to the environment and which has been determined by the board to be an "orphan" well.

Sources of Plugging Funds

Fee Idle well fee

Definitions

Orphan Well

According to Mississippi's statutes, "orphan well" is any oil or gas well in the state, including Class II wells, which has not been properly plugged according to the requirements of the statutes, rules and regulations governing same and for which a responsible party, such as an owner or operator, cannot be located or for which, there is no other party which can be directed to plug the well.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Base	\$100,00		

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Maximum	\$50,000		> 20,000
Mid	\$30,000		16,001 - 20,0
Mid	\$15,000		10,001 - 16,0
Minimum	\$10,000		< 10,000

Statutory Authorities

Definitions

Mississippi Code §53-1-3

Plugging Fund

Oil and Gas Conservation Fund: Mississippi Code, § 53-1-77

Authority to Regulate

Mississippi Code, § 53-1-17

Security or Financial Assurance

Date Security First Required:	1992
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☒
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☐
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☒
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix P: Missouri

Regulatory Authority

Department of Natural Resources
PO Box 250
Rolla, MO 65402
www.dnr.mo.gov/geology

Background

Missouri began regulating oil and gas wells in 1966. Statutes for ground water protection, plugging and abandonment, and bonding have been revised on several occasions. Regulation is accomplished through the Division of Geology and Land Survey under the Department of Natural Resources.

State Plugging Efforts

Missouri has an Oil and Gas Remedial Fund to help plug their orphan wells. All monies in the plugging fund are generated from forfeited bonds. Missouri also has a statute found in Chapter 259 declaring illegal oil, illegal gas, and illegal product to be contraband, and upon seizure and sale the proceeds shall be deposited into the fund.

Sources of Plugging Funds

Fine Civil penalties

Definitions

Abandoned Well

An abandoned well is defined as a unit with a permanent plug in accordance with the oil and gas regulations.

Orphan Well

Orphan wells are not statutorily defined in Missouri.

Temporarily Abandoned Well

A temporarily abandoned well is defined as a well which is not in operation for more than 90 days. Every two years, the well operator must demonstrate that a temporarily abandoned well is capable of production or plug the well.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Minimum	\$20,000	(0 -800 ft)	< 50
Mid	\$30,000	(801 – 1,20	< 15

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Maximum	\$4,000	+ \$1 / per square foot	> 5,001
Mid	\$4,000		2,001 - 5000
Mid	\$3,000		1,001 - 2,000
Mid	\$2,000		501 - 1,000
Minimum	\$1,000		0 - 500

Statutory Authorities

Authority to Regulate

Missouri RSMo. Chapter 259

Security or Financial Assurance

Date Security First Required:	1966
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☒
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☐
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☒
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix Q: Montana

Regulatory Authority

Board of Oil & Gas Conservation
2535 St. John's Avenue
Billings, MT 59102
www.bogc.dnrc.state.mt.us

Background

Regulation of oil and gas wells in Montana began in 1954. Bonding requirements were increased in 1993. Statutes give the Montana Board of Oil and Gas Conservation the authority to regulate the drilling, casing, and production and plugging of wells in a manner to prevent waste or pollution. This includes wells that are abandoned and the responsible party cannot be found. Montana has applied to EPA for primacy to regulate its Class II injection wells.

State Plugging Efforts

Montana's plugging funds come from the oil and gas production damage mitigation account that is statutorily appropriated in Title 82 of the Montana Code. Bond forfeitures are also used for well plugging.

Sources of Plugging Funds

Revenue	Forfeited bonds
Tax	Production assessment

Definitions

Abandoned Well

No definition is established for the term "abandoned well."

Orphan Well

No definition is established for the term "orphan well."

Temporarily Abandoned Well

No definition is established for the term "temporarily abandoned well."

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Base	\$50,000		

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Maximum	\$10,000	> 3,500	
Mid	\$5,000	2,001 - 3,500	
Minimum	\$1,500	< 2,000	

Statutory Authorities

Plugging Fund

Oil and Gas Production Damage Mitigation Account: 82-11-161

Authority to Regulate

82-11-111

Security or Financial Assurance

Date Security First Required:	1954
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☒
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☐
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☒
Letter of Credit	☐
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix R: Nebraska

Regulatory Authority

Nebraska Oil & Gas Conservation
PO Box 399
Sidney, NE 69162
www.nogcc.ne.gov

Background

The Oil and Gas Conservation Act for the regulation of oil and gas was adopted Sep. 28, 1959. However, the first regulations that gave authority to the Nebraska Geological Survey were adopted in 1940 and updated in 1956. § 57905(3)(c) of the Nebraska Revised Statutes gives the Oil and Gas Conservation Commission the authority to require drilling, casing, operating, and plugging of wells to prevent: 1) the escape of oil or gas out of one stratum into another; 2) the intrusion of water into oil or gas strata; 3) the pollution of freshwater supplies by oil, gas, or saltwater; and 4) the prevention of blowouts, cave-ins, seepages and fires.

State Plugging Efforts

The Well Plugging and Abandonment Trust Fund was created not only to plug abandoned wells, but also to complete surface restoration through the collection of a fee. Rule-making is required to establish the fees that are deposited into the fund.

Sources of Plugging Funds

Fee	
	Idle well fee

Definitions

Other

Though Nebraska does not define orphaned, abandoned, or temporarily abandoned wells, the state defines an inactive well as either shut-in or temporarily abandoned.

Blanket Bonds

	Amount	Add'l Criteria	Number of Well
Base	\$25,000		

Single Well Securities

	Amount	Add'l Criteria	Depth	Base
	\$5,000			

Statutory Authorities

Plugging Fund

Well Plugging and Abandonment Trust Fund: Revised Statutes, § 57-923

Authority to Regulate

Revised Statutes, § 57-905(3)(c), § 57-923 and Title 267, Chapter 3-040 of the rules and regulations

Security or Financial Assurance

Date Security First Required:	1959
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☒
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☐
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix S: Nevada

Regulatory Authority

Commission on Mineral Resources
400 West King Street, Suite 106
Carson City, NV 89703-4212
www.minerals.state.nv.us

Background

Regulation of the Nevada oil and gas industry began in March 1954 with ground water protection and plugging and abandonment procedures. The Department of Minerals was created on July 1, 1983 and given the responsibility to regulate oil and gas activities. In October 1993, the department was changed to the Division of Minerals under the Nevada Department of Business and Industry. Regulations have been amended in 1976, 1987 and 1994. The Division of Minerals has the authority to require the plugging of wells to prevent the escape of oil or gas, as well as the authority to require a reasonable bond for plugging purposes. The Nevada Division of Environmental Protection is responsible for the regulation of injection wells. In July 1999, the Division of Minerals underwent reorganization, and is now part of the Nevada Commission of Mineral Resources. Regulation 522.430 reads: 1. "Each well in which production casing has been run but which has not been operated for one year, and each well in which no production casing has been run and for which drilling operations have ceased for 30 days, must be immediately plugged." 2. "The administrator may, for good cause, grant an additional six months for the well to be plugged." Division of Minerals policy requires the operator to conduct an inspection to determine the integrity of the wellhead, etc., prior to the extension request being granted.

State Plugging Efforts

Nevada has no orphan wells.

Definitions

Abandoned Well

Nevada classifies a well as abandoned when production of oil/gas has ceased and the well becomes unprofitable.

Notes

Nevada considers a well to be shut in when the valves are closed and the well stops producing.

Temporarily Abandoned Well

Nevada considers a temporarily abandoned well as one that has been shut in but not plugged.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Base	\$50,000		

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>	Base
	\$10,000			

Statutory Authorities

Definitions

Rules of Practice and Procedure, 522.430

Authority to Regulate

Idle Wells: NRS 522.040

Security or Financial Assurance

Date Security First Required:	1954
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☒
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☐
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix T: New Mexico

Regulatory Authority

New Mexico Oil Conservation
1220 South St. Francis Drive
Santa Fe, NM 87505
www.emnrd.state.nm.us/ocd

Background

The New Mexico Oil Conservation Commission was created in 1935 and empowered to promulgate regulations to protect ground water by plugging and abandonment. The Oil Conservation Division has been given authority to require dry or abandoned wells to be plugged in a way that confines the oil, natural gas, or water to the strata in which they are found and to expend the oil and gas reclamation fund and take all actions necessary to plug dry or abandoned oil and gas wells in accordance with the provisions of the Oil and Gas Act, including disposition of salvageable equipment and material removed from wells being plugged. Significant revisions include: the 1950 requirement of a bond; the 1957 requirement that water from oil-producing pools with water-driven reservoirs be disposed of in disposal wells; the 1967 elimination of pit disposal; the 1977 increase of the blanket bond to \$50,000; the 1986 addition of cash bonds as acceptable security; the 1987 requirement for mechanical integrity testing (MIT) on all wells that have not produced for one year; and the 2000 amendment to allow acceptance of irrevocable letters of credit as financial security.

State Plugging Efforts

New Mexico has an Oil and Gas Reclamation Fund comprised of a percentage of the severance tax and forfeited plugging bonds. This plugging fund covers the cost of environmental site remediation and the cost of plugging orphaned wells. New Mexico has not found any orphan wells needing to be plugged since about 2004, and they anticipate that they have found them all and placed them on their plugging list.

Sources of Plugging Funds

Revenue Forfeited bonds

Definitions

Abandoned Well

An abandoned well is an inactive well with either an unknown or an insolvent operator.

Notes

A shut-in well is defined as a production or injection well that is temporarily inactive, whether by closing a valve or disconnection or other physical means.

Orphan Well

Although not statutorily defined, an orphan well is recognized as a well without a financially responsible operator.

Other

New Mexico uses the term inactive well to describe a well not being utilized for beneficial purposes such as production, injection, or monitoring and which is not being drilled, completed, repaired, or worked over

Temporarily Abandoned Well

A temporarily abandoned well is defined as a well that is inactive and has been approved for temporary abandonment in accordance with the New Mexico Oil Conservation Division. Temporarily abandoned well status may be approved for up to five years.

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>	Base
\$10,000	+ \$1/ft	Other counties		
Base	\$5,000	+\$1/ft	Major	

Statutory Authorities

Plugging Fund

Oil and Gas Reclamation Fund: NMSA 1978, §70-2-38

Authority to Regulate

NMSA 1978, § 70-2

12.B (1); NMSA 1978, § 70-2-14

Security or Financial Assurance

Date Security First Required:	1935
Modified Since 2000 Survey	☒
Regulatory Authority Adjustment	☐
Separate Site Restoration Bond	☒

Types of Security Bonds Allowed

CD	☐
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☒
Liens	☐
Security Interest	☒
Surety and/or Performance Bonds	☒

Appendix U: New York

Regulatory Authority

Department of Environmental
625 Broadway, Third Floor
Albany, NY 12233-6500
www.dec.ny.gov

Background

Current requirements for the regulation of oil and gas wells were put in place in 1963, especially with regard to ground water protection and bonding procedures. However, statutes that required wells to be plugged and abandoned were in place as early as 1879. The Environmental Conservation Law gives the Division of Mineral Resources the authority to enter, take temporary possession of, plug, or replug an abandoned well when an owner or operator neglects or refuses to comply with the rules and regulations. Rules also make it unlawful to shut in or temporarily abandon a well for more than one year or 90 days, respectively, without department approval.

State Plugging Efforts

New York's plugging fund is funded through permit fees, settlements, and legislative appropriations. There are approximately 40,000 wells drilled in the state for which no records exist. Additional orphan wells are located each year.

Sources of Plugging Funds

<i>Fee</i>	Permit fee
<i>Fine</i>	Settlements
<i>Public</i>	Appropriations

Definitions

Abandoned Well

An abandoned well is defined as any unplugged well shut in for more than one year without department approval and whose ownership might or might not be known.

Orphan Well

New York classifies an orphan well an inactive well with an operator which cannot be found.

Temporarily Abandoned Well

A temporarily abandoned well is one in which

operations have been discontinued or the well has been closed in without plugging and abandonment operations.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Minimum	\$25,000	to \$100,000	
Maximum	\$40,000	to \$150,000	

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Maximum	\$0	Anticipate d costs	6,000
Mid	\$5,000		2,501 - 6,000
Minimum	\$2,500		< 2,500

Security covers plugging & restoration

Statutory Authorities

Plugging Oil and Gas Wells

Environmental Conservation Law, Article 23-0305

Authority to Regulate

Environmental Conservation Law, Article 23-0805

Security or Financial Assurance

Date Security First Required:	1963
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☐
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☒
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix V: North Dakota

Regulatory Authority

Industrial Commission
600 East Boulevard Avenue, Department
Bismarck, ND 58505-0840
www.dmr.nd.gov/oilgas

Background

Oil conservation laws and rules were enacted in 1941, although oil was not discovered within the state until 1951. Significant changes since that time include increased bond amounts in 1961, the abolition of the use of earthen pits for produced water storage in 1969, monitoring the disposal of drilling pit fluids in 1982, the requirement for mechanical integrity testing on temporarily abandoned wells in 1990, as well as other bond increases. The North Dakota Industrial Commission is responsible for regulating idle wells.

State Plugging Efforts

Title 38 of the North Dakota Century Code establishes the abandoned oil and gas well plugging and site reclamation fund. North Dakota collects funds for the purpose of plugging abandoned wells. Funds are received in many ways including the cost of drilling permits.

Sources of Plugging Funds

<i>Fee</i>	Permit fee
<i>Fine</i>	Civil penalties
<i>Public</i>	Operating budget
<i>Revenue</i>	Forfeited bonds
<i>Revenue</i>	Salvage

Definitions

Abandoned Well

An abandoned well is defined as one which has had equipment removed, or has failed to produce oil or gas for one year.

Orphan Well

North Dakota does not statutorily define orphan wells.

Temporarily Abandoned Well

A temporarily abandoned well is defined as a well approved by the director with stipulations for temporary abandoned status for one year (NDAC 43-02-03-55).

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Minimum	\$50,000	< 10	
Maximum	\$100,00	> 10	

The \$50,000 blanket bond is limited in its coverage to contain no more than three unplugged dry holes, plugged wells with site not reclaimed, and/or abandoned wells;

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Base	\$20,000		

Wells drilled to a total depth of 2,000 feet may be bonded in a lesser amount upon approval

Statutory Authorities

Plugging Fund

Abandoned Oil and Gas Well Plugging and Site Reclamation Fund [North Dakota Century Code, § 38-08-04.(5)]

Definitions

North Dakota Administrative Code 43-02-03-55

Authority to Regulate

North Dakota Century
Code, § 38-08-04 (2)]

Security or Financial Assurance

Date Security First Required:	1941
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☐
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☐
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☐
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix W: Ohio

Regulatory Authority

Ohio Department of Natural Resources
2045 Morse Road, Buildings H2 & H3
Columbus, OH 43229-6693

Background

The Division of Oil and Gas was created in 1965 and established as the state's regulatory authority. However, actual regulation began in 1883 when the state's first oil and gas law was enacted to control methods used to case and plug oil and gas wells to prevent water from penetrating and contaminating the oil- and gas-bearing rock. Plugging and abandonment procedures and ground water protection were established with the creation of the Division of Oil and Gas.

The Division of Mines of the Ohio Department of Industrial Relations oversees and supervises plugging operations that are located in a coal-bearing township. Significant revisions to the statutes include: the required restoration of lands disturbed after drilling and plugging a well (1974); permit issuance, well construction and monitoring and reporting requirements (1982); elimination of brine storage pits and establishment of standards to define contamination of water supplies (1985); amendment of annular disposal rules (1990); establishment of the Orphan Well Landowner Grant Program (1995); and multiple rule changes in 1998. According to § 1509.12 of the Ohio Revised Code, the agency shall order any well that is incapable of production in commercial quantities to be plugged unless written permission is granted.

State Plugging Efforts

Ohio's plugging funds come from oil and gas severance taxes.

Sources of Plugging Funds

Tax Production assessment

Definitions

Abandoned Well

Ohio defines an abandoned well as one that has been deserted without being properly

Temporarily Abandoned Well

A temporarily abandoned well is a unit for which permission has been given to delay plugging.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Minimum	\$15,000		
Maximum	\$30,000		
\$30,000 bond for financial statements			

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Base	\$5,000		

Statutory Authorities

Plugging Oil and Gas Wells

Procedure Upon Failure to Comply with Plugging Requirements: [Chapter 1509.071]

Authority to Regulate

Chapter 1509.12 of the Ohio Revised Code

Security or Financial Assurance

Date Security First Required:	1963
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☐
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☒
Letter of Credit	☒
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix X: Oklahoma

Regulatory Authority

Oklahoma Corporation Commission
PO Box 52000
Oklahoma City, OK 73152-2000
www.occeweb.com

Background

In 1915, the Oil Conservation Division of the Oklahoma Corporation Commission was given exclusive jurisdiction over all wells drilled for exploration and production of oil and gas. Regulation for ground water protection and for plugging and abandonment procedures began in 1917. The Well Plugging Act passed in 1965. In Oklahoma, the Corporation Commission has sole and exclusive authority to regulate oil and gas activities, but cannot issue informal policies.

State Plugging Efforts

Oklahoma has a Corporation Commission Plugging Fund, as established in Title 17 of the Oklahoma Statutes and is funded through an excise tax of one hundredth of one percent of the gross value of oil and gas produced.

Sources of Plugging Funds

Tax	Excise tax

Definitions

Abandoned Well

Corporation Commission policy provides that an abandoned well is a well drilled before or since the regulatory program was established, is not currently producing, has not received regulatory approval to remain idle or temporarily abandoned and has an unknown or insolvent operator.

Under Title 17 O.S., § 53.3, relating to abandoned oil and gas well-site equipment, a state lien clause provides a definition for abandoned well-site equipment that also can be applied to the well. Part B of the referenced statute specifies: "Well-site equipment is presumed abandoned if: 1. For longer than one year, the well has shown no activity in terms of production, injection, disposal or testing, and has not otherwise been maintained in compliance with plugging rules; and 2a. The last operator of record is without valid surety as required by Title 17 O.S., § 318.1 and cannot be located by the Commission after diligent search, or 2b. The last operator of record has plugging liability in excess of the amount of such operator's surety as filed with the Commission." The section clarifies this language in Part E by stating "For purposes of this act the term 'abandoned well' shall mean those wells that are described and listed in a report published by the commission identifying oil or gas wells which have been determined to be abandoned or orphaned by the commission as a result of bankruptcy, inability to find the owner, or for other reasons."

Temporarily Abandoned Well

Oklahoma Corporation Commission policy provides that a

temporarily abandoned well is defined as a well drilled since the regulatory program was established, is not currently producing, has received regulatory approval to remain idle or temporarily abandoned and has a known and solvent operator. OAC 165:10-113 requires that a cased well be plugged within one year after cessation of production, an uncased well be plugged within 72 hours after completion of drilling or testing, and a well with surface casing only be plugged within 90 days after completion of drilling or testing. OAC 165:10-11-9 allows for exception to OAC 165:10-11-3 provided that the well is placed in an environmentally safe condition. Abandonment is valid for two years with extensions available for good cause. Wells granted temporary exemption from plugging are considered "temporarily abandoned wells" in Oklahoma.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Minimum	\$25,000		
Maximum	\$50,000		
Net worth for financial statement			

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Base	\$0	Varies as established by licensed plugger	

Statutory Authorities

Plugging Oil and Gas Wells

Plugging and Abandonment: [OAC 165: 10-11-9 and OAC 165: 10-11-3].

Authority to Regulate

Idle Wells: Title 52 O.S., § 139

Security or Financial Assurance

Date Security First Required:	1922
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☐
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☒
Letter of Credit	☒
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix Y: Pennsylvania

Regulatory Authority

Department of Environmental Protection
PO Box 8765
Harrisburg, PA 17105-8765

Background

The Bureau of Oil and Gas Management was given responsibility for oil and gas regulation in 1955. Pennsylvania has had legislation in place requiring non-producing wells to be plugged to protect the formation since the 1890s. Legislation in 1984 updated plugging requirements to include environmental considerations, require bonding, and allow for a specified period of approved non-production before the well must be plugged. Act 57 of Nov. 26, 1997, amended the administrative code and exempted any well drilled prior to April 18, 1985, from the bonding requirements of the Oil and Gas Act. Operators with existing Phased Deposit Bonds can continue with that bonding option, however, there is no new eligibility for Phased Deposit Bonding. Fees in lieu of bonding were eliminated for pre-act wells.

State Plugging Efforts

Pennsylvania's Abandoned Well Plugging Fund is established in Title 58 of the Pennsylvania's statutes and states that all fines, civil penalties, permit and registration fees collected under the Oil and Gas Act, are appropriated to the Department of Environmental Resources to carry out plugging operations. A \$50 surcharge in addition to the permit fee established by the department is charged and paid into the State Treasury to be set aside for the Abandoned Well Plugging Fund.

There is a restricted revenue account known as the Orphan Well Plugging Fund. In addition to the permit fee established by the department, a \$100 surcharge for all new wells to be drilled for oil production and a \$200 surcharge for wells to be drilled for gas production are placed in the Orphan Well Plugging Fund, and are expended only to plug orphan wells. If an operator rehabilitates a well abandoned by another operator or an orphan well, the permit fee and the surcharge for such well are waived. Expenditures by the department for the plugging of orphan wells are limited to fees collected under the act and no funding from the General Fund is available for this purpose.

Sources of Plugging Funds

Fee Permit fee

Definitions

Abandoned Well

Pennsylvania defines an abandoned well as one that has not been used to produce, extract, or inject gas, petroleum, or other liquids within the preceding 12 months; a well for which the equipment necessary for production, extraction, or injection has been removed; or a well considered dry and not equipped for

production within 60 days of drilling. However, the term does not include wells granted inactive status.

Orphan Well

In 1992, the state added a definition of an orphan well as any well abandoned prior to the effective date of the Oil and Gas Act (April 18, 1985) that the current landowner or lessee never operated or affected and has not yielded the current owner, operator, or lessee any economic benefit except as a landowner or recipient of royalty interest. The Oil and Gas Act also makes it illegal to identify a well as an orphan well by misrepresentation.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Base	\$25,000		
Security covers drilling, plugging, water supply, replacement and restoration			

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Base	\$2,500		

Statutory Authorities

Plugging Oil and Gas Wells

Title 58 P.S. Chapter 11 Oil and Gas Act, Chapter 6 Misc Provisions, §601.601

Authority to Regulate

P.L 1140, No. 223; 58 P.S. § 601.20; Oil and Gas Act (58 PS 601.509(4))

Security or Financial Assurance

Date Security First Required:	1985
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☐
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☐
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix Z: South Dakota

Regulatory Authority

Department of Environment & Natural
2050 West Main, Suite One
Rapid City, SD 57702
www.state.sd.us/denr/des/mining/oil&gas

Authority to Regulate

Idle Wells: SDCL 45-9-11

Background

The regulation of oil and gas wells in South Dakota began in 1939. Ground water protection and plugging and abandonment regulations followed in 1943. Enhancement of the ground water regulations occurred in 1960 and 1967. Regulations for plugging and abandonment were enacted in 1960, 1974, 1985 and 1996 and were accompanied by appropriate increases in bonding amounts for plugging and for surface restoration.

South Dakota statutes give the Department of the Environment and Natural Resources the authority to regulate the drilling and plugging of wells and all other operations. A water and environment fund is designated for well rehabilitation and plugging.

State Plugging Efforts

No orphan wells.

Definitions

Abandoned Well

South Dakota has no definition for abandoned wells.

Orphan Well

South Dakota has no definition for orphaned wells.

Temporarily Abandoned Well

In reference to temporarily abandoned wells, South Dakota states that a well with production casing may not be temporarily abandoned for more than six months unless the secretary grants the operator an extension.

Statutory Authorities

Plugging Fund

Well Rehabilitation and Plugging Subfund [SDCL 46-2-23]

Definitions

Idle Well: Rule: ARSD 74:10:04:03

Appendix AA: Tennessee

Regulatory Authority

Department of Environment and
401 Church Street, 1st Floor, L&C Annex
Nashville, TN 37243-0435
<http://www.state.tn.us/environment/>

Background

Regulation of oil and gas wells, including plugging and abandonment procedures, began in 1972. Ground water protection rules also came into place that year. Improvements to the program since that time include regulations to limit the blanket bond to 10 wells in 1987 and additional changes to the bonding provisions in 1988. The Tennessee Division of Geology is responsible for regulating idle wells.

State Plugging Efforts

Sources of Plugging Funds

Fine Civil penalties

Definitions

Abandoned Well

There is no official definition for abandoned well. However, the State Oil and Gas Board of Tennessee recognizes any well that is no longer being operated by the official operator of record as being abandoned. No definitions are provided by statute or rule for any of these terms. Tennessee uses the sum of all penalty payments to fund various projects, including the plugging of abandoned wells.

Orphan Well

There is no official definition for orphaned well.

Temporarily Abandoned Well

There is no official definition for temporarily abandoned well.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Base	\$20,000		

Required when the landowner/lessee is not party to the leasing agreement

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Base	\$5,000		

Statutory Authorities

Authority to Regulate

Temporarily Abandoned Well: [1040-2-2-.02(3) and 1040-4-2-.10]

Plugging Fund

State Oil and Gas Board Reclamation Fund [T.C.A. § 60-1-404]

Security or Financial Assurance

Date Security First Required:	1943
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☐
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☐
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix BB: Texas

Regulatory Authority

Railroad Commission of Texas
PO Box 12967
Austin, TX 78711

Background

The Railroad Commission of Texas (RRC) was given authority in 1919 for the regulation of oil and gas wells. Rule 20 for ground water protection was implemented in 1919. Plugging and abandonment procedures were initiated through Statewide Rules 10(b), 13 and 23 on Oct. 17, 1933. Chapter 89 of the Texas Oil and Gas Conservation Laws and Statewide Rule 14 give the RRC authority to require the plugging of abandoned oil and gas wells, and that authority was extended in 1965 to plug wells using state funds. Available funds at that time consisted of general revenue appropriations. However, a dedicated well plugging fund was created in 1983 and expanded 1991. Chapter 91 of the Texas Oil and Gas Conservation Laws enlarged the plugging fund and established the Oil Field Cleanup Fund to plug wells and remediate pollution sites abandoned by oil and gas operators. Changes in the bonding program were made in 1983, 1991 and 1995.

State Plugging Efforts

Sources of Plugging Funds

Tax Production assessment

Definitions

Abandoned Well

An abandoned well is defined as a well that has been abandoned or has not been operated for a period of 12 or more months.

Temporarily Abandoned Well

A temporarily abandoned well is defined as a well that is currently not in service. An abandoned well is defined as a unit that has not reported production for the preceding 12 months, and whose current operator's commission-approved organization report has lapsed.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Minimum	\$25,000		1 – 10
Mid	\$50,000		11 – 100
Maximum	\$250,00		> 100

For reclamation plants only; in the amount required to close the facility

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Base	\$2	Per foot	Total

Statutory Authorities

Authority to Regulate

Idle Wells: [Texas Oil and Gas Conservation Laws, Chapter 89 and Statewide Rule

Security or Financial Assurance

Date Security First Required:	1983
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☐
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☐
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☒
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix CC: Utah

Regulatory Authority

Utah Department of Natural Resources
PO Box 145801
Salt Lake City, UT 84114-5801
www.ogm.utah.gov/oilgas

Background

Regulation of oil and gas in Utah began in 1955, including rules governing ground water protection and plugging and abandonment. Authority for drilling, operating, producing, and plugging wells is found in the Utah Code Annotated, § 40-6-1.

In 1983, the Utah Legislature revised the Oil and Gas Conservation Act to improve regulatory responsibilities for ground water protection, site restoration, well plugging, and adequate bonding amounts. In 1993, the Division of Oil, Gas and Mining established and distributed a guidance document referring to Oil and Gas E&P Waste Disposal Strategy. In 1996 the division prepared and distributed an Environmental Handbook for the oil and gas exploration and production (E&P) industry. In 1999, the division notified operators of compliance status regarding the Shut-in and Temporarily Abandoned Wells Rule (Rule R649-3-36).

The Division of Oil and Gas and Mining is primarily responsible for the regulation of idle wells, and shares that responsibility with the U.S. Bureau of Land Management, the U.S. Bureau of Indian Affairs, the Utah Division of Forestry, Fire and State Lands, and the Utah School and Institutional Trust Lands Administration because of their respective leasing responsibilities on various types of public land.

State Plugging Efforts

Sources of Plugging Funds

Tax Excise tax

Definitions

Abandoned Well

There is no regulatory definition of abandoned well; however, the standard usage of the term is a well no longer in use, whether drilled as a dry hole, or which has ceased to produce or inject, or which cannot be operated.

Temporarily Abandoned Well

A temporarily abandoned well is one that has been completed, is not shown capable of production in paying quantities, and is not presently being operated.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Minimum	\$15,000		1000 – 3000
Mid	\$30,000		3,001 – 10,000
Maximum	\$60,000		> 10,000

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Maximum	\$120,000		> 1,000
Minimum	\$15,000		< 1,000

Security covers drilling, plugging, water supply, replacement and restoration

Statutory Authorities

Plugging Fund

Utah Code Annotated, §40-6-14.5

Authority to Regulate

Utah Code Annotated, § 40-6-1 et. Seq

Security or Financial Assurance

Date Security First Required:	1955
Modified Since 2000 Survey	☒
Regulatory Authority Adjustment	☐
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☒
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix DD: Virginia

Regulatory Authority

Department of Mines, Minerals & Energy
PO Box 1416
Abingdon, VA 24212
www.dmme.virginia.gov/dgo

Background

Virginia first enacted statutory standards in 1948. However, the regulatory program began in 1950, with creation of the Oil and Gas Board. The Department of Mines, Minerals and Energy was created in 1985. The Virginia Statutes give specific authority for the abandonment or cessation of a well and the orphan well program to the Department. State regulations established in 1950 address protection for ground water and plugging and abandonment procedures. The Virginia Gas and Oil Act passed in 1990, with subsequent regulations finalized in 1991 and further revised in November 1998.

State Plugging Efforts

The Orphan Well Fund was statutorily established as a non-lapsing revolving fund to be administered by the Department pursuant to the provisions of this section. The Orphan Well Fund is funded through appropriations by the General Assembly. Further, operators applying for a new permit for any activity other than geophysical operations are required to pay a \$50 surcharge per permit into the Orphan Well Fund. Interest earned on the Orphan Well Fund remains in the fund, which is legislatively established on the books of the state comptroller so that any funds remaining at the end of the biennium will not revert to the general fund, but are restricted to the purposes of restoration and plugging of orphan wells. So that, in the event of a discontinuance of the Orphan Well Fund, any remaining funds are designated to the Gas and Oil Plugging Restoration Fund.

The director is authorized to conduct a survey to determine the condition and location of orphan wells in the Commonwealth and to establish priorities for the plugging and restoration of the identified orphan wells. The plugging and restoration of orphan well sites which pose an imminent danger to public safety are identified as having the highest priority.

State statutes require that the director make every reasonable effort to identify and obtain the permission of a surface owner prior to entering onto the surface owner's land. In all cases, the director is required to publish a notice of the proposed plugging and restoration work to be conducted on the property in a newspaper of general circulation in the county or city where an orphan well is located.

Sources of Plugging Funds

Fee Permit fee

Definitions

Orphan Well

The Code of Virginia defines an orphaned well as a well abandoned prior to July 1, 1950, or a well for which no records exist concerning drilling, plugging, or abandonment.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Minimum	\$25,000		1 – 15
Mid	\$75,000		31 – 50
Mid	\$50,000		16 – 30
Maximum	\$100,00		> 50

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Base	\$10,000	+ \$2,000 / per acre	

Statutory Authorities

Plugging Fund

Orphan Well Fund: [§ 45.1-361.40]

Authority to Regulate

§ 45.1-361.34

Security or Financial Assurance

Date Security First Required:	1955
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☐
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☐
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix EE: West Virginia

Regulatory Authority

Department of Environmental Protection
601 57th Street, Southeast
Charleston, WV 25304

Background

West Virginia initiated regulating oil and gas operations in 1929, including plugging and abandonment procedures. Ground water protection legislation, passed in 1969, was revised in 1991. The West Virginia Abandoned Well Act passed in 1992 incorporates into West Virginia Code, § 22-10 language requiring financial responsibility for all wells, establishing abandoned well plugging priorities, and providing for interested party plugging. Abandoned Well Regulations 35-6 were enacted in 1993. The West Virginia Division of Environmental Protection, Office of Oil and Gas, is responsible for regulation of idle wells.

State Plugging Efforts

West Virginia's statutes provide for an oil and gas reclamation fund to be administered by the secretary. The secretary is responsible for preparing plans to reclaim and plug abandoned wells which have not been reclaimed or plugged, or which have been improperly reclaimed or plugged. The secretary has authority to reclaim and plug such wells as funds become available in the oil and gas reclamation fund. The fund may also be utilized for the purchase of abandoned wells, where necessary and for the reclamation of those wells, as well as for any engineering, administrative and research costs as might be incurred in process of reclaiming and plugging all wells, abandoned or otherwise.

Sources of Plugging Funds

Fee	Permit fee
Revenue	Forfeited bonds

Definitions

Abandoned Well

The state defines an abandoned well as any well that is completed as a dry hole or has not been in use for 12 consecutive months, or has not shown any bona fide future use.

Orphan Well

For purposes of the Abandoned Well Program, even

though "orphaned well" is not a defined term in the statute, it is considered to be a well having no production reported to the state since 1984, having no affidavit on file showing total plugging, and not identified as a storage, secondary recovery, or disposal well in the oil and gas data system.

Other

West Virginia classifies wells as having an "inactive status" when they are not producing or injecting and have received state approval to remain idle by demonstrating the existence of bona fide future use.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Base	\$50,000		

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Base	\$5,000		

Statutory Authorities

Plugging Fund

Reclamation Fund:[WV Code 22-6-29]

Definitions

WV Code 22-6-19 and 22-10, State Regulations 35-5 and 35-6, and 40 CFR 146.3

Authority to Regulate

West Virginia Code 226 and 22-10

Security or Financial Assurance

Date Security First Required:	1963
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☐
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☒
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☒
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

Appendix FF: Wyoming

Regulatory Authority

Oil & Gas Conservation Commission
PO Box 2640
Casper, WY 82602
<http://wogcc.state.wy.us>

Background

Regulation of oil and gas wells, as well as plugging and abandonment procedures under the current Wyoming program, began on Aug. 21, 1951. Revisions include 1) establishment of Underground Injection Control programs in 1981; 2) pit regulation revisions in 1984 and 1992; 3) changes in 1982 and 1991 to rules governing plugging of shallow seismic holes; 4) bonding revisions, amendment of the waste rules, and well status definitions in 1992; and 5) rules on reporting water flows and mechanical integrity testing in 1993.

Wyoming Statutes § 30-5104 created the Oil and Gas Conservation Commission and gave it authority to require that drilling, casing, or plugging wells be done in such a manner as to prevent the escape of oil or gas from one stratum into another and the pollution of freshwater supplies by oil, gas, or salt water. It also enabled the Commission to use funds collected under Wyoming Statutes § 30-5-116 (conservation tax) to plug wells and reclaim the surrounding area under the State Plugging Fund. Also under § 30-5-104, the Commission was granted authority to require the furnishing of a reasonable bond. Regulation for ground water protection began on April 16, 1981. Bonding levels for wells on Wyoming leases are established by the State Land and Farm Loan Office. The Bureau of Indian Affairs is responsible for the regulation of idle wells on the Wind River Indian Reservation.

State Plugging Efforts

Wyoming has a plugging fund supported by a conservation tax levied on oil and gas revenue, bond revocations, fines and equipment sales. Under the statute the reclamation fund can also be replenished through the disposal of abandoned equipment by public sale or by transferring it to the contractor who performs the plugging and reclamation for the commission.

Sources of Plugging Funds

Tax Excise tax

Definitions

Abandoned Well

A permanently abandoned well means a one that is no longer considered active and has been permanently plugged and abandoned, as provided by these rules, in such a manner as

to prevent migration of oil, gas, and water or other substances from the formation or horizon in which it originally occurred.

Temporarily Abandoned Well

Temporarily abandoned wells are those in which the completion interval has been isolated from the wellbore above, and the surface. The completion interval may be isolated by a retainer, bridge plug, cement plug, tubing and packer with tubing plug or any combination thereof.

Blanket Bonds

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Number of Well</i>
Base	\$75,000		
Additional amount may be required for dormant wells or pits; Agency requires bonding for some pits			

Single Well Securities

	<i>Amount</i>	<i>Add'l Criteria</i>	<i>Depth</i>
Maximum	\$20,000		> 2,000
Minimum	\$10,000		< 2,000

Statutory Authorities

Plugging Fund

[§30-5-104]

Authority to Regulate

[§ 30-5-104 and Rules 304, 315, and 316]

Security or Financial Assurance

Date Security First Required:	1951
Modified Since 2000 Survey	☐
Regulatory Authority Adjustment	☐
Separate Site Restoration Bond	☐

Types of Security Bonds Allowed

CD	☒
Cash	☒
Certificate of Insurance	☐
Consolidated Financial Fund	☐
Escrow Account	☐
Financial Statements	☐
Letter of Credit	☒
Liens	☐
Security Interest	☐
Surety and/or Performance Bonds	☒

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LIST OF ACRONYMS AND ABBREVIATIONS

AARP	American Association of Retired Persons
AE	Alberta Department of Energy
AENV	Alberta Environment
ASRD	Alberta Sustainable Resource Development
CAPP	Canadian Association of Petroleum Producers
DCNR	Department of Conservation and Natural Resources
DEP	Department of Environmental Protection
EASI	Environmental Alliance for Senior Involvement
EPA	U.S. Environmental Protection Agency
EUB	Alberta Energy and Utilities Board
FAC	Fund Advisory Committee
IOGCC	Interstate Oil & Gas Compact Commission
OERB	Oklahoma Energy Resources Board
OWA	Orphan Well Association
PaSEC	Pennsylvania Senior Environment Corps
SEPAC	Small Explorers and Producers Association of Canada



Interstate Oil and Gas Compact Commission
P.O. Box 53127
Oklahoma City, OK 73152-3127



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INTERSTATE
Oil & Gas
COMPACT COMMISSION

ORPHAN WELL APPROPRIATED FUND DISBURSEMENT POLICY

FEBRUARY 28, 2008

ORPHAN WELL APPROPRIATED FUND DISBURSEMENT POLICY

INTRODUCTION

The following fund disbursement framework is prepared as part of a cooperative agreement with the United States Department of Energy (DOE) National Energy Technology Laboratory. The agreement includes the development of model matching award criteria, guidelines, program explanations, accountability and reporting requirements and forms.

BACKGROUND

Section 349 of the Energy Policy Act of 2005 provides for the establishment of a program to provide technical and financial assistance to oil and gas producing states to facilitate remediation of environmental problems caused by orphaned or abandoned oil and gas exploration or production well sites on State or private land.

The Act endorses the Secretary of Energy to work with the states, through the Interstate Oil and Gas Compact Commission (IOGCC), for the development of a program that quantifies and mitigates environmental risks associated with onshore that includes mechanism to facilitate (a) identification of persons currently providing a bond or other form of financial assurance for an oil or gas well that is orphaned or abandoned (b) criteria for ranking orphaned or abandoned well sites (c) information and training practices on best practices for remediation of different types of sites and (d) funding of state mitigation efforts on a cost-shared basis. \$25,000,000 per year for fiscal years 2006 through 2010 is authorized to be appropriated to carry out these activities and the Federal Reimbursement for Orphaned Well Reclamation Pilot Program

The Orphan Well Task Force, comprised of IOGCC volunteer representatives from member states, was formed in order to address the requirements related to section 349 of the Act, leveraging the combined experience and expertise of oil and gas community members to create comprehensive guidance documents that encompass all management aspects, including regulatory, legal, economic, environmental, and educational issues.

POLICY STATEMENT

The appropriation fund disbursement policies are designed to be used in conjunction with IOGCC Orphan Well Appropriation Fund Award and Administration procedures. It is the recommendation of the Task Force that in-depth procedures be developed upon receipt of the funds and that a web-based application be developed to facilitate efficient and effective fund disbursement, data collection and analysis, recordkeeping and reporting.

Recognizing our responsibility as representatives of the oil and natural gas producing states of the nation, the Task Force disbursement guidelines are based upon the following principles:

1. The protection of public safety and the environment;
2. The appropriate stewardship of federal funds;
3. A fair and equitable distribution of funds based upon the greatest need;
4. Respect for the jurisdiction of the participating states; and
5. The efficient distribution of funds with a minimum of bureaucratic red tape.

ORPHAN WELL APPROPRIATED FUND DISBURSEMENT POLICY

DEFINITIONS

1. **APPROPRIATED FUNDS:** funds which may be appropriated by Congress for the plugging of orphaned wells authorized by the 2005 Energy Policy Act.
2. **AUTHORIZED REPRESENTATIVE:** the administrative official who, on behalf of the state oil and gas agency is empowered to make certifications and assurances and can commit the agency to the conduct of the project as well as adhere to various policies and requirements
3. **FUND ADMINISTRATOR:** The Interstate Oil and Gas Compact Commission (IOGCC)
4. **MODEL PLUGGING PRIORITIZATION SCHEDULE:** Model developed by the task force
5. **ORPHAN WELL:** a well that is not producing or injecting, has not received state approval to remain idle, and for which the operator is unknown or insolvent.
6. **PLUGGING:** permanently sealing a wellbore to prevent fluid migration.
7. **SITE RESTORATION:** the removal of equipment, trash and debris, repair of erosion, removal of hydrocarbons and closing pits
8. **STATE AGENCY:** the state oil and gas agency that receives the disbursement and assumes legal and financial responsibility and accountability both for the awarded funds and the performance of funded activities.

ELIGIBILITY REQUIREMENTS

In order to qualify for disbursement of appropriated funds participating states must:

1. Have an operational plugging fund and plugging prioritization processes in place for the plugging of abandoned wells
2. A United States oil and gas producing state
3. An IOGCC member state or associate member state

DISBURSEMENT OF FUNDS – GENERAL

Funds will be pre-allocated to eligible states based on:

1. The number of orphan wells estimated by participating state
2. The number of orphan wells that have the most potential to graded potentially damaging
3. Spending cap per individual well: spending caps will be evaluated based upon industry and regional averages upon receipt of appropriated funds and reevaluated on a regular basis to be determined by the Task Force.

PRIORITIZATION SCHEDULE

It is recommended that state agencies incorporate the Model Plugging Prioritization Schedule into plugging and site restoration policies or procedures. State will be required to submit the Model Plugging Prioritization Schedule with reimbursement requests to assist with data collection.

ORPHAN WELL APPROPRIATED FUND DISBURSEMENT POLICY

COST-REIMBURSEMENT AWARD

IOGCC will reimburse the participating state for work performed and/or costs incurred by the state agency

State Oil and Gas Directors and their authorized agents may request reimbursement for expenditures related to the plugging and/or site restoration of abandoned or orphan wells within their jurisdiction.

Requests for reimbursement must include at a minimum:

1. Model Plugging Prioritization Schedule
2. Copies of supporting documentation for expenditures
3. Signature of certifying official

COST-MATCHING REQUIREMENTS

Cost-matching will be determined by state plugging policies. The maximum amount of reimbursement funds shall not exceed the Task Force designated spending cap per well.

Participating agencies agree to report the entire cost of well plugging and site remediation for the purposes of data collection, analysis and reporting.

CERTIFICATIONS AND ASSURANCES

Participating state agencies will certify and agree to:

1. Participate in output and outcome measurements and reporting requirements including but not limited to the number of wells plugged, plugging criteria factors adapted from the Model Plugging Prioritization Schedule, and the amount of matching funds.
2. To carefully consider hazards to health, safety and the environment when prioritizing wells to be remediated utilizing appropriated funds.
3. Submit an statement to the Fund Administrator certifying appropriate use of federal funds
4. Certify that a prioritization process is in place in applicable plugging policies and procedures
5. Certify that cost-sharing and matching will be in applicable plugging policies and procedures
6. Share success stories, and participate for public outreach information dissemination efforts

ATTACHMENTS

1. Section 349 of the Energy Policy Act of 2005
2. Model Fund Plugging Prioritization Schedule



INTERSTATE
Oil & Gas
COMPACT COMMISSION

PLUGGING PRIORITIZATION SCHEDULE FOR ORPHANED AND ABANDONED WELL SITES

MAY, 2008

PLUGGING PRIORITIZATION SCHEDULE FOR ORPHANED AND ABANDONED WELL SITES

PREFACE

The Interstate Oil and Gas Compact Commission (IOGCC) recognizes the pressing need for the plugging and abandonment of orphaned and idle wells. The need has also been recognized by the Congress of the United States and federal funds have been authorized to aid in this national project.

This project is designed to bring partnership between federal and state governments to properly plug and abandon orphaned wells and restore the well sites. The management and accountability practices for the matching funds program reside within the IOGCC and include expenditure documentation consistent with existing state plugging programs.

The adoption of a consistent prioritization schedule by the IOGCC, for both single and multiple well abandonment, will aid in the fair, systemized allocation of matching funds to those oil and gas regulatory programs demonstrating need.

PLUGGING PRIORITIZATION SCHEDULE FOR ORPHANED AND ABANDONED WELL SITES

GENERAL WELL DATA

Lease Description	
Well Name:	API No:
Priority:	
Operator (Last Recorded):	Financial Security:
Legal Location:	County / Parish:
Location in Section:	
Well Vintage:	Inactive Period:
Type of Well (Oil / Gas / UIC / Other):	
Surface Condition: (Note presence of any equipment)	
Subsurface Condition: (Note presence of any equipment)	
Estimated Gross Plugging / Remediation Cost: Requested Funds: State Matching Funds: State Agency: By: Signature _____ Name _____ Title _____ Date _____	Approved Matching Funds: Amount: By: IOGCC Signature _____ Name _____ Title _____ Date _____

PLUGGING PRIORITIZATION SCHEDULE FOR ORPHANED AND ABANDONED WELL SITES

MULTI-WELL FIELD/AREA DATA

Lease Description	
Field/Area Name:	
Priority (Worst Well Data):	
Operator (Last Recorded):	Financial Security:
Number of Wells:	Number of Acres Affected:
Legal Location:	County / Parish:
Well Vintage:	Inactive Period:
Type of Well (Oil / Gas / UIC / Other):	
Surface Condition: (Note presence of any equipment)	
Subsurface Condition: (Note presence of any equipment)	
Estimated Gross Plugging / Remediation Cost: Requested Funds: State Matching Funds: State Agency: By: Signature _____ Name _____ Title _____ Date _____	Approved Matching Funds: Amount: By: IOGCC Signature _____ Name _____ Title _____ Date _____

PLUGGING PRIORITIZATION SCHEDULE FOR ORPHANED AND ABANDONED WELL SITES

SCORE SHEET FOR WELL PLUGGING AND LOCATION RESTORATION PRIORITIZATION

Score Sheet for Type of Threat			
Well or Field/Area Name:			
Item	Factors to be Considered	Remarks	Points
1. Leaking Well (Circle all that apply) Volume/Concentration will be a factor	H ₂ S Gas Oil Water Brine		
2. Hazard to Navigation (Circle applicable conditions)	Submerged Navigable Non-Navigable None		
3. Secure Well with Pressure (Circle applicable conditions)	Unknown PSIG >200 PSIG <200 PSIG High Fluid Level Possible Cross Flow		
4. Site with Substantial Waste Impact (Circle applicable conditions)	Oil Grease Saltwater NORM Other		
5. Wellhead Existence/Condition (Circle applicable conditions)	EXISTENCE Yes No		
	CONDITION Acceptable Unacceptable Unknown		
6. Well Tubulars – Casing (Circle applicable conditions)	EXISTENCE Yes No		
	CONDITION Acceptable Unacceptable Unknown		
Notes (Give detailed description of other location hazards)			
Points This Page			

PLUGGING PRIORITIZATION SCHEDULE FOR ORPHANED AND ABANDONED WELL SITES

SCORE SHEET FOR WELL PLUGGING AND LOCATION RESTORATION PRIORITIZATION

Score Sheet for Type of Threat			
Well or Field/Area Name:			
Item	Factors to be Considered	Remarks	Points
7. Well Within 300 Feet	Public Building/Residence Public Water Supply Surface Water/Wetland Sensitive Flora/Fauna Sensitive Environmental Area		
8. Well Within 1,320 Feet (Circle applicable types)	Public Building/Residence Public Water Supply Surface Water/Wetland Sensitive Flora/Fauna Sensitive Environmental Area		
9. Land Use and Ownership (Circle applicable types)	Crop Pasture Forestry Fee State Federal		
10. Problems with Accessibility of Well (Circle applicable conditions)	Hillside Ravine Migrating Stream Urban Restrictions Other (Explain)		
Notes (Give detailed description of other location hazards)			
Points This Page			
Points From Previous Page			
TOTAL SCORE			

PLUGGING PRIORITIZATION SCHEDULE FOR ORPHANED AND ABANDONED WELL SITES

WELL PLUGGING AND LOCATION RESTORATION PRIORITIZATION SYSTEM

Item No.	Factors to be Considered	Points	Hazard H/S/E*
1a	Leaking Well with Hydrogen Sulfide (H ₂ S) Present and at Potentially Dangerous Levels	50	H/S
1b	Leaking Well-Natural Gas-within 100 feet of Public Building or Residence	35	S
1c	Leaking Well - Natural Gas	30	S
1d	Leaking Well - Produced Fluids> 1 BBL/Day	30	E
1e	Leaking Well - Produced Fluids < 1 BBL/Day	10	E
2a	Hazard to Navigation - Well Submerged or at Surface	30	H/S
2b	Hazard to Navigation-Well in Navigable Waterway-Shipping or Boat Hazard	20	H/S
2c	Well in Any Body of Water - Creek, River, Swamp, Wetland	10	E
3a	Well not Leaking but Unknown Pressure on Tubing or Casing Strings	25	H/S
3b	Well not Leaking but Pressure on Tubing or Casing > 200 psig	20	H/S
3c	Well not Leaking but Pressure on Tubing or Casing < 200 psig	15	H/S
3d	Well not Leaking but with Fluid Level Capable of Contaminating Aquifer	10	E
4	Site with Substantial Impact for Oil, Grease, Saltwater or NORM or Other	5	E
5	Well Without Wellhead	5	S/E
6	Well Without Production Casing	4	S/E
7a	Well Within 300 feet of Public Building or Residence	8	H/S
7b	Well Within 300 feet of Public Water Supply, Groundwater or Surface Water	7	H
7c	Well Within 300 feet of Surface Water or Wetland	6	E
7d	Well Within 300 feet of Habitat of Endangered, Threatened, or Rare Flora/Fauna	5	E
7e	Well Within 300 feet of Sensitive Water Environmental Area	3	E
8a	Well Within 1,320 feet of Public Building or Residence	4	H/S
8b	Well Within 1,320 feet of Public Water Supply - Groundwater or Surface Water	3	H
8c	Well Within 1,320 feet of Surface Water or Wetland	2	E
8d	Well Within 1,320 feet of Sensitive Environmental Area	3	E
9	Well on Lands Used for Crops or Pasture	1	E
10a	Well With Accessibility Problems Due to Topography	5	E
10b	Well With Accessibility Problems Due to Urbanization	5	S/E

*Health / Safety / Environment

Priority Table	
Priority Based on Points	Cumulative Points
Priority 1	>30
Priority 2	>19
Priority 3	>10
Priority 4	10 and Under

IOGCC 2008 SALES & PRODUCTION SURVEY DATA

REVISED 02/19/2010

Send corrections, comments, or additions to the attention of Rachel Amann, Rachel.amann@iogcc.state.ok.us

ST	Oil Wells					
	Active	Inactive	Permitted	P&A	Production	Sales
ALABAMA	577	359	44	31	7,689,547	
ALASKA	2,054	686	144	80	249,873,742	233,620,021
ARIZONA	15	15	0	0	51,575	51,575
ARKANSAS	6,941	771	152	69	5,913,563 ¹	5,913,563
CALIFORNIA	52,540	20,768	2,885	1,490	238,607,976	238,607,976
COLORADO						
FLORIDA	61	43	8	2	1,955,521	1,955,521 ²
GEORGIA	0	0	0	0	0	0
IDAHO	0	1	0	0	0	0
ILLINOIS	26,000	6,500	625	609	9,500,000	9,500,000 ³
INDIANA	3,465	1,119	220	251	1,858,311	1,858,311 ⁴
KANSAS	52,644	4,323	1,621	754	39,586,000	39,586,000
KENTUCKY	26,107	4,990	1,153	489	2,645,193 ⁵	2,645,193
LOUISIANA	20,680	11,221	564 ⁶	77	72,633,561	72,633,561 ⁷
MARYLAND	0	0	0	0	0	0
MICHIGAN	3,674	470	296	71	5,720,463	5,720,463
MISSOURI	458	152	169	6	98,927	98,927
MISSISSIPPI	3,093		168	24	20,533,771	20,491,585
MONTANA	4,468	2,400	199	67	31,538,900	31,505,100
NEBRASKA	1,207	311	93	20	2,393,504	2,389,696
NEVADA	75	21	13	2	436,271	436,271
NEW MEXICO	20,669	2,074	1,277	331	60,167,768	59,805,772
NEW YORK	3,617	1,527	250	105	397,060	397,060
NORTH CAROLINA						
NORTH DAKOTA	4,281	516	937	81	62,776,123	62,365,832
OHIO	26,156	2,388	476	197	5,554,235	5,554,235
OKLAHOMA	83,443 ⁸	N/A	2,126 ⁹	679	65,268,490 ¹⁰	65,268,490
OREGON						
PENNSYLVANIA	19,093	28	1,973	140	3,600,000	3,600,000 ¹¹
SOUTH CAROLINA	0	0	0	0	0	0
SOUTH DAKOTA	162	14	27	3	1,696,792	1,696,792
TENNESSEE						
TEXAS	156,588	103,637	4,736	3,855	352,628,026	352,572,524
UTAH	3,016	812	435	41	22,009,732	21,772,995

¹ Marked "N/A" on survey; Entered sales figures as an estimate for comparison purposes only² "Sales" not reported; production entered as an estimate for comparison purposes only³ "Sales" not reported; production entered as an estimate for comparison purposes only⁴ Sales" left blank; production entered as an estimate for comparison purposes only⁵ "Production" was not reported; "Sales" figure entered as an estimate for comparison purposes only⁶ 192 were permitted for gas or oil in LA⁷ Listed as "unavailable"; "Production" figures entered for comparison purposes only⁸ Estimate⁹ Well permit data includes oil and gas; 6,039 total permits issued; wells permitted is estimated based on the ratio of oil wells completed and gas wells completed in the year of 2008 for comparison only¹⁰ "Production" was not reported; "Sales" figure entered as an estimate for comparison purposes only¹¹ Listed as "not tracked"; "Production" figures entered for comparison purposes only

IOGCC 2008 SALES & PRODUCTION SURVEY DATA

REVISED 02/19/2010

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	Oil Wells					
ST	Active	Inactive	Permitted	P&A	Production	Sales
VIRGINIA	3	8	0	0	15,712	15,712 ¹²
WASHINGTON						
WEST VIRGINIA	3,957	740	186 ¹³	13	1,184,580	1,184,580 ¹⁴
WYOMING	11,543	3,457	489	223	52,952,216	52,534,128
	Oil Wells					
CANADIAN AFFILIATES	Active	Inactive	Permitted	P&A	Production	Sales
Alberta	42,559	25,170	2,989	1,703 ¹⁵	661,710,000	624,859,000
British Columbia						
Newfoundland/Labrador	58	14	8	9	125,245,251	125,245,251 ¹⁶
Nova Scotia						
Saskatchewan						
Yukon	0	3	0	0	0	0

	Natural Gas Wells					
ST	Active	Inactive	Permitted	P&A	Production	Sales
ALABAMA	6,539	206	397	107	279,450,843	237,800,628
ALASKA	170	75	30	2	151,304,314	121,591,569
ARIZONA	6	2	0	0	523,130	503,037
ARKANSAS	5,538	409	1,388	50	449,901,336 ¹⁷	449,901,336
CALIFORNIA	1,654	795	230	100	296,949,914	232,260,804
COLORADO						
FLORIDA	0	0	0	0	2,835,069	2,835,069 ¹⁸
GEORGIA	0	0	0	0	0	0
IDAHO	0	0	0	0	0	0
ILLINOIS	349	80	32	4		
INDIANA	740	271	126	24	4,701,382	4,701,382 ¹⁹
KANSAS	25,185	2,003	1,581	201	377,386,000	377,386,000
KENTUCKY	18,905	3,650	566	40	114,116,089 ²⁰	114,116,089
LOUISIANA	19,441	5,136	1,571 ²¹	65	1,360,213,375	1,350,250,922
MARYLAND	7	0	0	0	49,541	7
MICHIGAN	10,665	238	595	21	158,309,319	158,309,319
MISSOURI	12	18	0	0	5,830	5,830
MISSISSIPPI	1,787		236	34	100,789,238	98,844,390
MONTANA	6,544	1,000	495	188	119,571,800	108,456,300

¹² "Sales" not reported; production entered as an estimate for comparison purposes only

¹³ Well permit data includes oil and gas; 2,577 total permits issued; wells permitted is estimated based on the ratio of active oil wells to active natural gas wells

¹⁴ "Sales" not reported; production entered as an estimate for comparison purposes only

¹⁵ Total all wells abandoned, excludes oil sands evaluation wells

¹⁶ "Sales" not reported; production entered as an estimate for comparison purposes only

¹⁷ Marked "N/A" on survey; Entered sales figures as an estimate for comparison purposes only

¹⁸ "Sales" not reported; production entered as an estimate for comparison purposes only

¹⁹ "Sales" not reported; production numbers entered as an estimate

²⁰ "Production" was not reported; "Sales" figure entered as an estimate for comparison purposes only

²¹ 192 were permitted for gas or oil in LA

IOGCC 2008 SALES & PRODUCTION SURVEY DATA

REVISED 02/19/2010

Send corrections, comments, or additions to the attention of Rachel Amann, Rachel.amann@iogcc.state.ok.us

	Natural Gas Wells					
ST	Active	Inactive	Permitted	P&A	Production	Sales
NEBRASKA	301	61	230	5	2,835,409	2,618,071
NEVADA	0	0	0	0	4,177	4,177 ²²
NEW MEXICO	27,592	625	967	241	1,457,217,237	1,400,498,209
NEW YORK	6,675	912	429	16	50,319,577	49,632,952
NORTH CAROLINA						
NORTH DAKOTA	223	10	6	2	87,192,320	56,727,957
OHIO	28,219	4,775	952	295	84,858,015	84,858,015
OKLAHOMA	41,921	6,198	3,913 ²³	403	1,734,285,220 ²⁴	1,734,285,220
OREGON						
PENNSYLVANIA	55,681	142	5,951	252	198,295,000	198,295,000 ²⁵
SOUTH CAROLINA	0	0	0	0	0	0
SOUTH DAKOTA	81	6	28	3	10,908,621 ²⁶	1,098,427
TENNESSEE						
TEXAS	96,502	30,773	5,523	1,636	7,048,187,667	6,831,533,324
UTAH	5,578	987	917	65	442,326,878	401,925,000
VIRGINIA	6,426				128,454,245	128,454,245 ²⁷
WASHINGTON						
WEST VIRGINIA	50,965	11,070	2,391 ²⁸	236	245,056,123	245,056,123 ²⁹
WYOMING	31,256	10,671	7,138	494	2,489,166,803	2,287,931,982
	Natural Gas Wells					
CANADIAN AFFILIATES	Active	Inactive	Permitted	P&A	Production	Sales
Alberta	111,815	29,206	7,851		4,723,200,000	4,723,200,000
British Columbia						
Newfoundland/Labrador	0	0	0	0	0	0
Nova Scotia						
Saskatchewan						
Yukon	2	2	0	0	2,678,313	1,865,683

	NGL		EOR			
ST	Production	Sales	Active	Inactive	Permitted	P&A
ALABAMA	2,464,406		132	26	2	0
ALASKA	124,465,464	78,085,632	1,182	213	28	2
ARIZONA	N/A	N/A	0	0	0	0
ARKANSAS	N/A	N/A	129	62	0	1

²² "Sales" not reported; "production figures entered as an estimate for comparison purposes only

²³ Well permit data includes oil and gas; 6,039 total permits issued; wells permitted is estimated based on the ratio of oil wells completed and gas wells completed in the year of 2008 for comparison onl

²⁴ "Production" was not reported; "Sales" figure entered as an estimate for comparison purposes only

²⁵ Listed as "not tracked;" "Production" figures entered for comparison purposes only

²⁶ Saleable gas; the total volume is large because of the high volumes of air injected and produced back to operate the 3 in situ combustion units in Buffalo Field

²⁷ "Sales" not reported; production entered as an estimate for comparison purposes only

²⁸ Well permit data includes oil and gas; 2,577 total permits issued; wells permitted is estimated based on the ratio of active oil wells to active natural gas wells

RE²⁹ "Sales" not reported; production entered as an estimate for comparison purposes only

IOGCC 2008 SALES & PRODUCTION SURVEY DATA

REVISED 02/19/2010

Send corrections, comments, or additions to the attention of Rachel Amann, Rachel.amann@iogcc.state.ok.us

	NGL		EOR			
ST	Production	Sales	Active	Inactive	Permitted	P&A
CALIFORNIA	79,102	79,102	8,803	6,149	745	250
COLORADO						
FLORIDA	N/A	N/A	25	19	0	0
GEORGIA	N/A	N/A	0	0	0	0
IDAHO	N/A	N/A	0	0	0	0
ILLINOIS			5,127	350	104	87
INDIANA	N/A	N/A	830	230	50	35
KANSAS	N/A	N/A	11,604	261	219	208
KENTUCKY	N/A	N/A	1,682	520	41	52
LOUISIANA	87,110,801	87,110,801 ³⁰	462	34	10	15
MARYLAND	N/A	N/A	0	0	0	0
MICHIGAN	472,794	472,794	558	61	0	24
MISSOURI	N/A	N/A	40	3	30	0
MISSISSIPPI	N/A	N/A	448		68	2
MONTANA	N/A	N/A	625	167	12	11
NEBRASKA	N/A	N/A	412	115	7	7
NEVADA	N/A	N/A	4	0	0	0
NEW MEXICO	N/A	N/A	3,001	538	29	69
NEW YORK	N/A	N/A	135	332	0	64
NORTH CAROLINA						
NORTH DAKOTA	5,296,490	5,296,490	576	97	37	11
OHIO	N/A	N/A	121	0	0	0
OKLAHOMA	N/A	N/A	5,822	4,190	250	14
OREGON						
PENNSYLVANIA	N/A ³¹	N/A ³²	2,018	5	26	16
SOUTH CAROLINA	0	0	0	0	0	
SOUTH DAKOTA	N/A	N/A	43	16	0	0
TENNESSEE						
TEXAS	N/A ³³		24,345	9,220	1,569	656
UTAH	4,465,066	5,080,160	1,117	39	23	2
VIRGINIA						
WASHINGTON						
WEST VIRGINIA	N/A	N/A	717	16	24	1
WYOMING	40,715,060 ³⁴	27,900,323	2,861	982	0	0
	NGL		EOR			
CANADIAN AFFILIATES	Production	Sales	Active	Inactive	Permitted	P&A
Alberta	220,800,000	220,800,000	6,082	1,989	212	
British Columbia						
Newfoundland/Labrador	0	0	0	0	0	0

³⁰ Listed as "unavailable"; "Production" figures entered for comparison purposes only³¹ "Not tracked"³² "Not tracked"³³ Comptroller should have this information³⁴ 2008 reflects NGL production and sales volume less CO2 and Helium sales which were included in prior years statistics

IOGCC 2008 SALES & PRODUCTION SURVEY DATA

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	NGL		EOR			
ST	Production	Sales	Active	Inactive	Permitted	P&A
Nova Scotia						
Saskatchewan						
Yukon	0	0	0	0	0	0

	SWD Injector				Gas Storage Wells			
ST	Active	Inactive	Permitted	P&A	Active	Inactive	Permitted	P&A
ALABAMA	80	3	1	3	12	0	0	0
ALASKA	66	27	2	0	3	1	0	0
ARIZONA	1	2	0	0	14	0	0	0
ARKANSAS	488	218	0	5	5	6	0	0
CALIFORNIA	826	604			231	147		
COLORADO								
FLORIDA	14	6	0	0	0	0	0	0
GEORGIA	0	0	0	0	0	0	0	0
IDAHO	0	0	0	0	0	0	0	0
ILLINOIS	1,021	40	37	16	1,200	0	1	1
INDIANA	154	35	14	7	780	1	31	4
KANSAS	4,588	94	202	56	833	29	0	0
KENTUCKY	118	4	2	0	431	11	2	1
LOUISIANA	2,639	141	120	38	17	0	4	0
MARYLAND	0	0	0	0	0	0	0	0
MICHIGAN	731	4	33	4	2,837	3	5	41
MISSOURI	176	6	16	0	38	0	0	0
MISSISSIPPI	489		29	3	138		8	1
MONTANA	486	4	18	2	268			
NEBRASKA	95	16	6	4	101	4	0	0
NEVADA	11	0	0	0	0	0	0	0
NEW MEXICO	610	61	68	10	0	0	0	0
NEW YORK	5	7	0	0	929	23	7	1
NORTH CAROLINA								
NORTH DAKOTA	292	20	22	3	0	0	0	0
OHIO	152	0	7	6	1,805	0	6	0
OKLAHOMA	3,629	2,328	230	53	9	5	1	0
OREGON								
PENNSYLVANIA	3	0	0	0	2,131	0	20	5
SOUTH CAROLINA	0	0	0	0	0	0	0	0
SOUTH DAKOTA	11	3	0	0	0	0	0	0
TENNESSEE								
TEXAS	7,011	2,733	617	164	160	115	17	0
UTAH	97	4	2	0	63	0	0	0
VIRGINIA					35			
WASHINGTON								
WEST VIRGINIA	73	0	6	2	1,390	1	26	2

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	SWD Injector				Gas Storage Wells			
ST	Active	Inactive	Permitted	P&A	Active	Inactive	Permitted	P&A
WYOMING	282 ³⁵	89	0	0	24	3	0	0
	SWD Injector				Gas Storage Wells			
CANADIAN AFFILIATES	Active	Inactive	Permitted	P&A	Active	Inactive	Permitted	P&A
Alberta	1,360	514	7		169	23	4	
British Columbia								
Newfoundland/Labrador	0	0	0	0	0	0	0	0
Nova Scotia								
Saskatchewan								
Yukon	1	0	0	0	0	0	0	0

³⁵ All WY EOR and secondary recovery injection wells are included . WY does not differentiate between EOR and other water injection wells under UIC Class II wells

IOGCC 2008 ORPHANED WELL SURVEY DATA

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STATE	Orphan Wells Plugged	Plug funds expended	Wait Listed	Undocumented / unidentified orphan wells
ALABAMA	0	0	3	0
ALASKA	0	0	9	0
ARIZONA	0	0	0	0
ARKANSAS	36	382,000	644	550
CALIFORNIA	53	2,345,427	292	967
COLORADO				
FLORIDA	0	0	17	150
GEORGIA				
IDAHO	0	0	0	0
ILLINOIS	3	112,240	3,825	0
INDIANA	84	462,760	785	2,500
KANSAS	525	2,519,351	6,788	20,000 - 40,000
KENTUCKY	105	294,746	12,660	2,000
LOUISIANA	173	4,524,380	2,712	No info available
MARYLAND	0	0	0	0
MICHIGAN	16	733,543	71	50
MISSOURI	0	0	2,000	0
MISSISSIPPI	0	0	0	0
MONTANA	13	105,936	56	300
NEBRASKA	0	0	6	6
NEVADA	0	0	0	0
NEW MEXICO ¹	30	1,454,282	190	0
NEW YORK	94	1,884,000 ²	4,717	40,000
NORTH CAROLINA				
NORTH DAKOTA	0	0	5	0
OHIO	23	281,030	495	9,000
OKLAHOMA	292	1,650,249	1,740	10,000
OREGON				
PENNSYLVANIA	236	1,492,654	8,827	100,000+
SOUTH CAROLINA	0	0	0	0
SOUTH DAKOTA	0	0	0	0
TENNESSEE	0	0	53	4000
TEXAS	1,337	14,666,175	8,846	N/A
UTAH	0	0	27	8
VIRGINIA	0	0	37	70
WASHINGTON				
WEST VIRGINIA	8	400,000	1,400	3,974
WYOMING	20	617,926	135	<5

¹ Fiscal year 07/2007 through 06/2008² Includes approximately \$1.8 million spent by EPA to plug abandoned leaking oil wells (OPA 90 funds)

IOGCC 2008 ORPHANED WELL SURVEY DATA

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CANADIAN AFFILIATES	Orphan Wells Plugged	Plug funds expended	Wait Listed	Undocumented / unidentified orphan wells
Alberta	5	887,000 ³	21	UNK
British Columbia				
Newfoundland/Labrador	N/A	N/A	N/A	N/A
Nova Scotia				
Saskatchewan				
Yukon	0	0	0	0

³ Canadian

THE JOURNAL OF THE INTERSTATE

OIL & GAS COMPACT COMMISSION

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NOVEMBER 2009

INSIDE:
**COLORADO'S
TECHNICAL
RESPONSES TO
RULEMAKING**

*Protecting wildlife resources.
Balancing energy production.
Cooperative solutions.*



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Sneak Preview for Anchorage, Alaska meeting, 5/11/09

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Colorado's Technical Responses to Rulemaking.



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Protecting Groundwater Through Technology.

8

Colorado's New E-Permitting Process.

A flexible, robust application that state agencies can adapt and modify according to their needs.

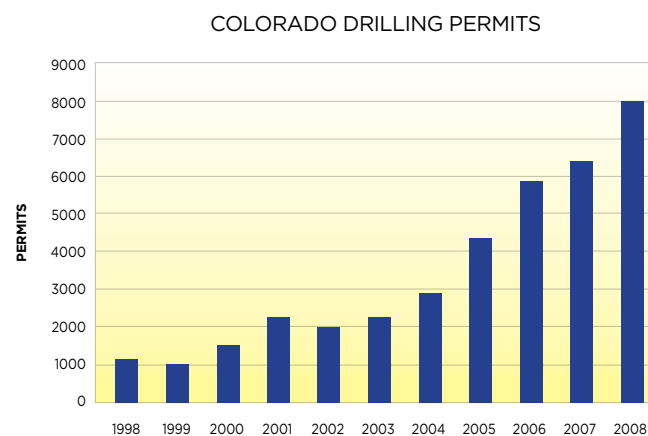


INTRODUCTION

“Neither a **wise man** nor a brave man
lies down on the tracks of history to wait for the train
of the future to run over him.”



Dwight D. Eisenhower
34th President of the United States

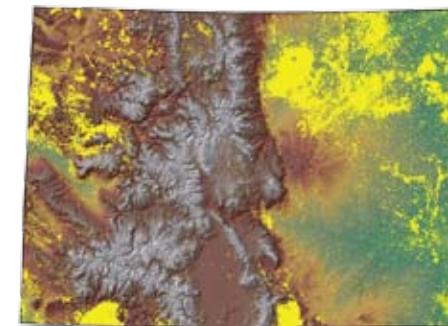


In 2008, the Colorado Oil and Gas Conservation Commission (COGCC) issued about 10 times as many permits as in 1998.

Change happens. It can be met head-on and, if not controlled, at least managed. Or, change can be denied until it becomes the director of its own course. Over the past decade, Colorado lawmakers were confronted with rapid development of that state's oil and gas resources, which they hoped to encourage, and increasing concerns about their continuing ability to protect the environment. Rules and resources that provided ample oversight of the oil and gas industry when the state permitted about 1,000 wells per year, as it did in the late 1990s, were becoming inadequate as the number of drilling permits increased nearly tenfold by 2008. Colorado lawmakers decided to manage burgeoning energy development to keep it on a course that takes advantage of the economic benefits of oil and gas production while continuing to protect the public and the environment.

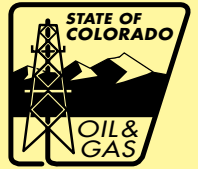
The 2007 Colorado General Assembly passed HB1298 and HB1341 to acknowledge the changing landscape and meet it head-on. The legislature declared that it is in the public interest for the Colorado Oil and Gas Conservation Commission (COGCC) to “plan and manage oil and gas operations in a manner that balances development with wildlife conservation in recognition of the state's obligation to protect wildlife resources and the hunting, fishing, and recreation traditions they support, which are an important part of Colorado's economy and culture.” The bills restructured the COGCC's Board of Commissioners to add commissioners with more diverse experience and directed the commission to update rules adding new provisions for minimizing adverse impacts to wildlife and ensuring proper reclamation of wildlife habitats. The legislation emphasizes the value of stakeholder involvement by requiring consultation with the Department of Wildlife (DOW) and surface owners prior to drilling in certain circumstances. It requires the COGCC to implement best management practices (BMPs) and other measures to conserve wildlife and encourages companies to develop comprehensive drilling plans to minimize surface disturbance and discourage habitat fragmentation.

Yellow represents the location of the 78,000+ wells that have been drilled for oil and gas in Colorado. About 38,000 are currently producing.



Revamping existing oil and gas rules in the midst of planning for a restructured board of commissioners would have been challenging under the best of circumstances, but the COGCC was already occupied with another major initiative to develop a computer application for online form submission. Adding unknown rules to the mix challenged staff to aim at what COGCC IT manager Marc Fine called “a moving target.”

COLORADO OIL AND GAS CONSERVATION COMMISSION



Mission Statement

The mission of the Colorado Oil and Gas Conservation Commission (COGCC) is to promote the responsible development of Colorado's oil and gas natural resources.

Responsible development results in:

- The efficient exploration and production of oil and gas resources in a manner consistent with the protection of public health, safety and welfare
- The prevention of waste
- The protection of mineral owners' correlative rights
- The prevention and mitigation of adverse environmental impacts

The COGCC seeks to serve, solicit participation from, and maintain working relationships with all those having an interest in Colorado's oil and gas natural resources.

Goals

- Promote the exploration, development and conservation of Colorado's oil and gas natural resources
- Prevent and mitigate adverse impacts to public health, safety, welfare and the environment
- Demonstrate balanced leadership in the regulation and promotion of oil and gas development in Colorado at the local, state and federal levels

Approached in 2005 by the Ground Water Protection Council (GWPC), a national association dedicated to preserving and protecting groundwater, the COGCC took a leading role in developing an online forms submission application for the states in the RBDMS (risk-based data management system) development group.

The project began to take shape as the basic design of the application was developed by working with the states to understand the requirements. The project team determined that the deliverable needed to be flexible enough that it could be installed in any state that wanted to use the application and adaptable enough to meet the various regulatory requirements of each state. The team also identified the need for an application that would allow submission of multiple regulatory forms in a single file transmission.

As work on the RBDMS progressed, the project team continued to work on a “wish list” of features. Industry had asked for the ability to track applications for drilling permits as they work their way through the approval process. Colorado wanted a tool to route the electronic form around the office for review and comment. In some states, multiple agencies might require access to data as part of the permitting process. Additionally, developers were able to incorporate what they call a “dashboard” that provides a number of tools, including one that allows the public to track and comment on pending applications.

*To acknowledge the changing landscape, **HB1298** and **HB1341** declared that it is in the public interest for the COGCC to “plan and manage oil and gas operations in a manner that balances development with wildlife conservation in recognition of the state’s obligation to protect wildlife resources and the hunting, fishing, and recreation traditions they support, which are an important part of Colorado’s economy and culture.”*



When lawmakers mandated the updating of Colorado oil and gas regulations during the summer of 2007, COGCC IT staff faced a challenge unlike any they had seen before. They were tasked with gathering requirements to design, develop, and implement a system for multiple agencies to review data when no one knew what the actual rules or data were going to be. That autumn, as the rule-making process began and the COGCC’s need for the e-permitting system was becoming more critical, funding from the GWPC was removed due to a change in its federal funding. Discussions between the two groups ensued and Colorado reached an agreement with the GWPC to draw on state funding along with using the entire existing code base that the GWPC had already funded. Colorado would work within the original design as much as possible and continue to provide the developed code to the GWPC’s RBDMS vault, and if and when the GWPC could reinstate funding, it would help Colorado complete its project.

As the rulemaking continued, the requirements continued to expand the application design, and the cost, beyond the original concept of the RBDMS Technical Committee. Just as the Colorado budget reached its limit,

the GWPC was able to re-establish funding to help the state complete its goals while continuing work toward a product that fit the specifications of the RBDMS design. With restored funding by GWPC as a stopgap, additional funds became available at the turn of the fiscal year in Colorado, helping with the added requirements and costs.

RBDMS is a PC- and Client/Server-Based, fully-relational and normalized information management system that was specifically designed for use by state oil & gas regulatory agencies responsible for oil & gas production and associated injection. The system is now used by twenty-two state oil & gas regulatory agencies in the United States and has since been expanded for use by private industry and other types of state and federal regulatory agencies. RBDMS is a modular system that includes data for oil, gas, UIC (Underground Injection Control program) and water quality, and online permitting, reporting, and data mining.



As rulemaking progressed, it became apparent that to focus on the rules, which were still a moving target, would not be the best use of the development team’s time. Instead, the focus was trained on a set of tools the agency could use to implement the rules regardless of what they turned out to be.

The basic requirement that the e-Forms fit into the RBDMS project was paramount, with an added challenge for Colorado to mold the rest of that state’s requirements to fit into the e-Forms project.

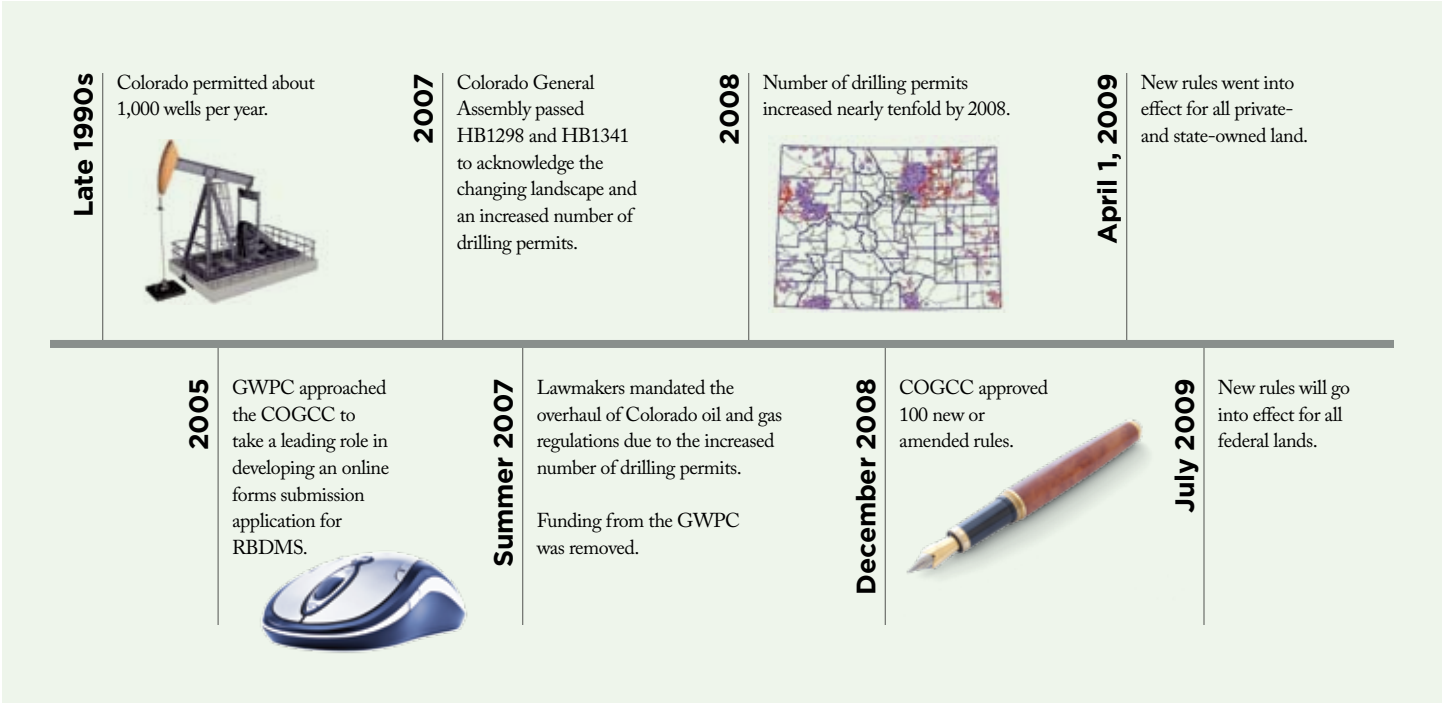
As the amended rules began to take shape, additional tools were needed. With little time to devote to complicated solutions, the simplest ideas were adapted. During the last year of the project, the team used a “modified agile approach” that allowed the development team and developers to implement ideas without waiting on a decision from the project manager, who ultimately made the final decision to accept or reject them.

The COGCC took final action in December 2008 on 100 new or amended rules after a lengthy process that included soliciting input from industry, environmental groups, property

owners, and local governments. The agency had conducted 24 days of hearings and encouraged public comment throughout the purposefully transparent process. The commissioners’ final action was taken by unanimous vote.

Many local governments and interest groups actively participated in the rulemaking process. Some supported the proposed new rules and amendments as providing enhanced protection for public health, the environment, and wildlife. Others feared a negative impact on an industry that has brought much needed employment and an improved tax base to parts of the state.

Meanwhile, industry was concerned that the rules would further delay an already sluggish permitting process. As discussion ensued, and controversy built, the COGCC forged



Many local governments and interest groups actively participated in the rulemaking process. Some supported the proposed new rules and amendments as providing enhanced protection for public health, the environment, and wildlife.

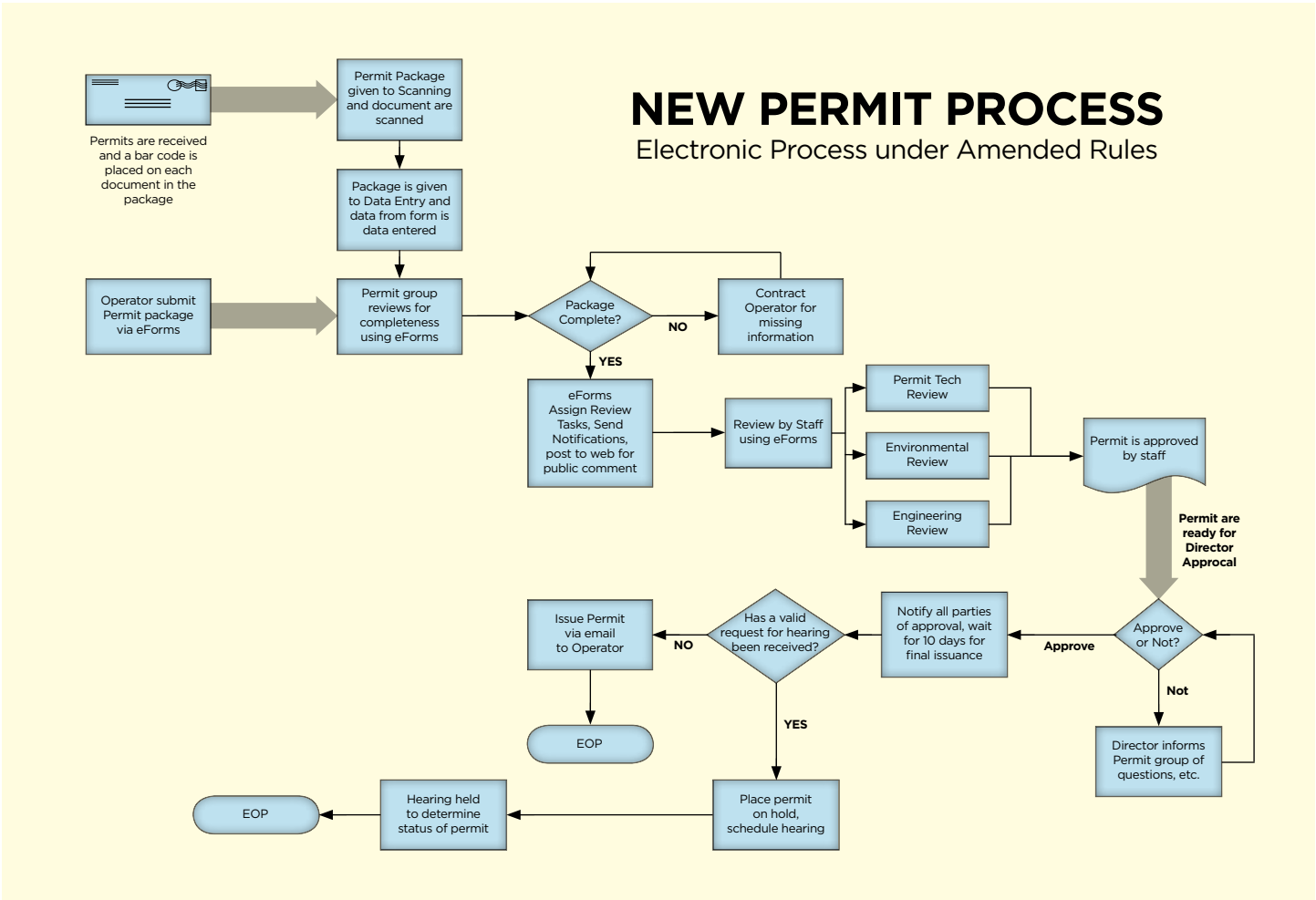
ahead and modified the proposed rules in response to expressed concerns. The final rules reflect substantial input from a broad range of parties, and provide a new consultation role for the state’s Division of Wildlife and its Department of Public Health and Environment in the COGCC permitting process. These rules went into effect for all private- and state-owned land as of April 1, 2009, and are scheduled to become effective on federal lands in July of 2009. To assure that there will be appropriate protections without redundancy, COGCC is in negotiations with federal agencies such as the Bureau of Land Management to develop a memorandum of understanding (MOU) to support implementation of the rules on federal land. In a further attempt to smooth the process, COGCC is conducting training sessions around the state. To date more than 500 individuals primarily representing industry, but also including interested others, have participated. A significant focus of the training is designed to showcase the impressive

results of the way COGCC met its challenge to create new tools that harness technology to improve the agency’s ability to fulfill its obligations to the citizens of Colorado.



During the 2008 IOGCC Annual Meeting in Santa Fe, NM, Chairman Gov. Brad Henry outlined that he will ramp up energy education efforts to important public constituencies in the name of educating those who have little knowledge of the importance of domestic energy resources.

Pictured here (from left to right): Larry Bengal, Arkansas; Victor Carrillo, Texas; Gov. Brad Henry, Oklahoma; Lynn Helms, North Dakota; Fred Steece, South Dakota; Don Bradshaw, Montana.



The Colorado Oil and Gas Commission's next steps include continued public outreach and education, by which it hopes to improve response to the rules and to identify further opportunities for enhancement of the system. Meanwhile, the e-Permitting module, already tested under fire and proven up to the task, will soon be added to the 'share-ware' available to states through the RBDMS project.

Colorado's proactive decision to manage change, from an unprecedented surge in oil and gas drilling to adapting advances in technology to meet the information demands of the new millennium, has culminated in a revitalized COGCC that is better equipped to balance energy development with environmental protection while preserving wildlife resources and the hunting, fishing, and recreation traditions they support, which are an important part of Colorado's economy and culture.

Key additions to Colorado's oil and gas rules

- An expanded COGCC Board of Commissioners: previously the commission was made up of seven members, five with oil and gas industry experience (two of the five were required to have a petroleum geology/engineering degree) and two non-industry members with environmental, agricultural, or reclamation experience. The new nine-member board is comprised of three members with industry experience (two of three with petroleum geology/engineering degree); two agency executive directors – one from the Department of Natural Resources, one from the Colorado Department of Public Health and Environment (CDPHE); one local government official; one royalty owner engaged in agriculture; one member with soil conservation/reclamation experience; and one member with environmental/wildlife experience.
- Operators are required to maintain adequate records of their operations to help emergency officials respond to spills, releases, and human exposure to toxic chemicals. The rules include provisions that allow companies to safeguard proprietary formulas or trade secrets while ensuring that medical professionals have access to information necessary to ensure public safety.
- Rules concerning Exploration and Production (E&P) wastes have been updated to include expanded reporting requirements, new specifications for pit liners, and more protective soil and ground water standards.
- Incentives have been added for operators to engage in landscape-level planning to assess and mitigate cumulative impacts over larger areas over longer periods of time.
- Specific rules apply only in areas where particular concerns must be addressed. The state has four distinct geologic basins and these rules give the COGCC the flexibility to focus on the site-specific demands of each area.

HB-1341

Expands and alters makeup of COGCC board of commissioners

- Before**
- ◆ 7 Members
 - ◆ 5 with experience in oil and gas (2 of the 5 required to have a petroleum geology/engineering degree)
 - ◆ 2 non-industry members with environmental, agricultural, or reclamation experience

- After**
- ◆ 9 Members
 - ◆ 3 with experience in oil and gas (2 of the 3 required to have a petroleum geology/engineering degree)
 - ◆ 2 Agency Executive Directors; one from DNR, one from CHPHE
 - ◆ 1 local government official
 - ◆ 1 royalty owner engaged in ag production
 - ◆ 1 member with soil conservation/reclamation experience
 - ◆ 1 member with environmental/wildlife protection experience

Highlights of the RBDMS system, which was led by and modified for the COGCC



- A browser-based form designer that allows agencies to design and develop a web page form that industry can fill in to submit a single form.
- An XML schema that defined the first regulatory forms the agencies would allow via the e-Forms project to be submitted in a multiple file form via the Internet.
- A business rules engine and editor that allows the applications to be adaptable and dynamic because users can modify the rules frequently without the need for IT intervention.
- A "dashboard" tool that allows tracking progress of forms. This module ends up as the main menu for all users.
- A flexible, robust application that state agencies can adapt and modify according to their needs.



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Special edition for Anchorage, Alaska meeting, 5/11/09

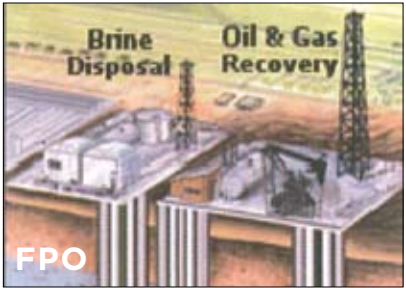
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“RBDMS is emerging as the mission critical tool for environmental protection and resource management in the country...”

– *Ground Water Protection Council*

INTRODUCTION

Any job, no matter how large, is easier to complete with the **right tools** at hand. The Ground Water Protection Council (GWPC) created a tool that helps state and federal regulatory agencies, citizens' groups, and the oil, natural gas, and mining industries to do a better job of protecting this country's precious natural resources. This tool is a web-based information-sharing platform that users can adapt to meet their individual requirements.

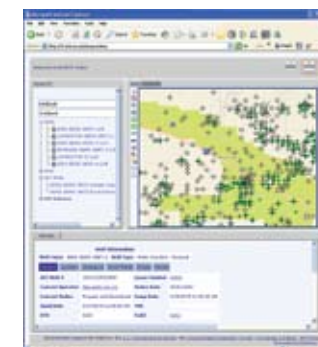
The original concept of RBDMS was development of a program that regulators could use to guide them in making informed decisions about managing Class II UIC wells and groundwater protection. The project has evolved into a collaborative platform that 23 states, the Department of Energy (DOE), the Environmental Protection Agency (EPA), the Bureau of Land Management (BLM), the public, and industry members nationwide use as a tool to access information, share data and ideas, and manage processes to maximize energy production while protecting the environment.



Developers of the RBDMS project asked themselves a simple question: "Can we develop a baseline data system to support informed decision-making and to protect and manage critical resources?" The driving force behind the question was the need to efficiently manage groundwater resources and protect the environment in the face of energy development and geologic disposal of waste.

RBDMS is a PC- and Client/Server-Based, fully-relational and normalized information management system that

was specifically designed for use by state oil and gas regulatory agencies responsible for oil and gas production and associated injection. The system is now used by several state oil and gas regulatory agencies in the United States and has since been expanded for use by private industry and other types of state and federal regulatory agencies.

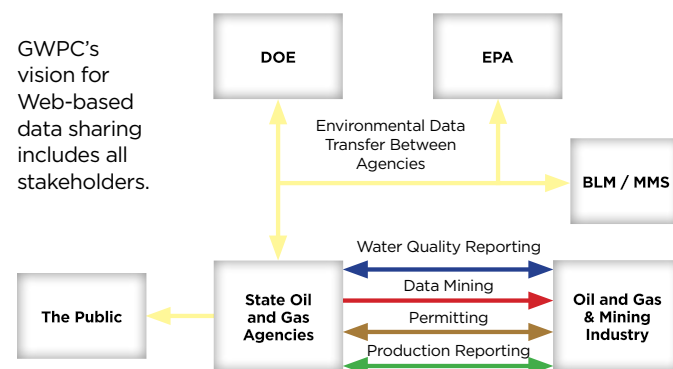


IN 1992, THE GWPC CONDUCTED A NATIONAL NEEDS ASSESSMENT OF 25 STATE OIL AND GAS REGULATORY AGENCIES.

The results include:

- All oil and gas producing states share basic operating procedures including issuing permits, inspecting wells, and complying with federal UIC (Underground Injection Control program) regulations under the Safe Drinking Water Act.
- In addition to the federal requirements, each state has operating procedures that are specific to geology and rules developed by state lawmakers and oil and gas commissions.
- Funding for information technology varies among states.

Based on the results of the needs assessment, the GWPC and pilot states recommended developing a data management system for UIC and oil and gas wells that would meet 85% of the needs of all oil and gas regulatory agencies. States could then take the Core System and customize it to meet their individual needs. One of the underlying features that continues to make RBDMS a success is the principle that this is a system designed by the states and built to state specifications. While the funding comes from the Department of Energy, the details of the system are left up to the states.



RBDMS (Risk-Based Data Management System)

is a modular system that includes data for oil, gas, UIC (Underground Injection Control program) and water quality, and online permitting, reporting, and data mining. CERA (Cost Effective Regulatory Approach), another GWPC initiative, focuses on creating "effective and efficient policies and environmental program improvements that participating state regulatory agencies can adopt."

In 1993 RBDMS was installed in **four** pilot states: Alaska, Nebraska, Montana, and Mississippi. This early version of RBDMS was a system designed for internal use by state agencies to manage injection and production information.

RBDMS has since expanded to 22 states and one Indian tribe and is now used by states, federal agencies, oil companies and consultants. The GWPC and the Department of Energy hold an annual training event where the new features of RBDMS are demonstrated. Attendees learn how to implement and customize RBDMS at these sessions.

Funded by the DOE, and matched with in-kind and state donations, the GWPC formed a task force from among its members to assist with the project. This task force is composed of a steering committee and technical advisory committees. The Steering Committee provides project direction and policy decisions. The RBDMS technical advisory group provides input to the steering committee on programmatic and information technology needs. Over the past six years, the states have contributed nearly half of the total funding for the project. Since

2000, more than \$14 million has been invested in RBDMS nationwide. Other significant funding has come by way of grants from organizations such as the New York State Energy Research and Development Authority (NYERDA).

The result of the collaboration between these stakeholders is an e-commerce-type platform that 23 states have adapted to their requirements. Nebraska, for example, runs its entire agency’s regulatory activities on RBDMS. The state uses it to monitor underground injection wells, record production data, and manage the oil and gas development permitting and reporting processes. Colorado, on the other hand, has developed its own system, which the Colorado Oil and Gas Conservation Commission (COGCC) uses. Even though Colorado doesn’t rely on the RBDMS system, the COGCC has contributed critical early and ongoing work to assist in RBDMS development.

Operating similar to an open-source or shareware community, the platform system is a project that GWPC task force members continue to expand against an ever-changing backdrop of issues. For example, when the project started, hydraulic fracturing was not regarded as a significant regulatory issue. Increased development of unconventional oil and gas from tight-sands, shales, and natural gas from coal seams, which all require hydraulic fracturing, has created a need for additional oversight in regions that are experiencing rapid new development. Similarly, some states are working to establish processes to handle the supervision of geologic sequestration of CO2 as the nation moves toward reducing greenhouse gases. Users are adapting RBDMS to respond to changes as they occur.

Beyond constantly shifting industry and environmental issues, technologies continue to be created and enhanced at an unprecedented pace. “Five or six years ago the tech committee tried to work with a GIS-type app. But the technology wasn’t there to do mapping and web-based applications. Now the technology is catching up,” notes Stan Belieu, task force steering committee member from Nebraska. “It is really important not to get too cutting edge. Exxon might be able to work with it, but states with small funding and a lack of programming staff can’t. This has to work for all users to be effective.” The committee also has



Over the past six years, the states have contributed nearly half of the total funding for the project.

Adaptability of RBDMS Between States

- NEBRASKA**
- 1. Runs entire agency regulatory activities on RBDMS
 - 2. Uses RDBMS to monitor underground injection wells, record production data, and manage the oil and gas development permitting and reporting processes

- COLORADO**
- 1. Does not use RBDMS
 - 2. Has developed its own system used by the Colorado Oil and Gas Conservation Commission
 - 3. COGCC contributed ongoing work to assist in RBDMS development

- RBDMS Steering Committee:**
- Stan Belieu, NE
 - Mark Bohrer, ND
 - Tom Richmond, MT
 - Don Drazan, NY

- RBDMS Technical Advisory Group:**
- Jim Lindholm, ND
 - Jim Halverson, MT
 - Dan Jarvis, UT
 - Marc Fine, CO
 - Chuck Borchert, NE
 - Dan Pearson, AR
 - Bob Griffith, OK
 - Lloyd Favor, OK
 - Bill Adkins, KY
 - Rick Sims, MS
 - Jimmy Hall, AL
 - Gregg Miller, OH
 - Amanda Trotter, NY

A data management system would meet 85% of all state’s technical needs.

Individual states can work with open source code to refine the system to specific needs.

Since 2000, more than \$14 million has been invested in RBDMS nationwide.

to factor in the changing political and regulatory environment, which responds to public concerns, economic shifts and other influences. As Marc Fine, IT manager at the Colorado Oil and Gas Conservation Commission, observes, “It is a challenge to know how to deal with emerging technology and rulemaking when you are developing the system to facilitate administration of rules and activity at the same time.”

The work proceeds in modules, led by task force members who are supported by technical work groups from member states. The work groups include experts in IT systems, programming, web interfaces and other critical specialties. The project is governed by the principles that it must be user-friendly and web-based, cost effective and adaptable. As Fine put it, “You want to build it once and reuse it multiple times. So you develop a basic framework with the proper requirements so that the same pages the operator will use to submit data are the same pages the agency will review to approve or monitor.”

Nebraska was keen on the integration of the GIS (geographical information system) capability, because staffers use it to overlay water wells and aquifers on oil and gas activity. On the first pass, five years ago, the challenges for integrating this application were overwhelming. Since that time, technology has evolved and Nebraska has been a champion of module development.

Colorado has remained active on the task force tech committee even though it did not use the entire RBDMS system. So three years ago, when the project committee needed an e-permitting application developed, it approached the COGCC. The concept was to have something portable and implementable in any state without difficulty, hence a browser-based application. Colorado agreed to pilot the module and received a grant to help support the development.

Bob Griffith, from Oklahoma, has participated in the tech committee for the past three years. Many times state technical staff will shift and change as the particular modules under development require different or additional expertise. Over the past 18 months, Griffith has been working on the rollout of an ITD (intent to drill) permit module. The ITD module is in the testing and installation phase and work is underway on another module that will track completion reports and operational changes. The end goal is to enable field inspectors to access the database with a mobile wireless-enabled laptop and to enter inspection information at the site. But, Griffith already is looking ahead to the next module – addressing UIC monitoring,

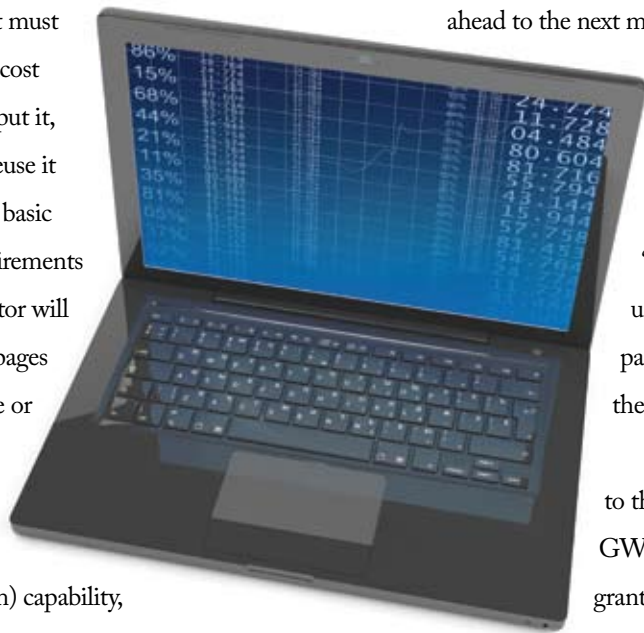
which includes EPA reports, GIS review, and compliance testing.

An enthusiastic supporter of the RBDMS program, Griffith says, “I call this ‘freeware’. You can get it, use it, customize it, get training. You’re part of a community that is always there for you.”

That community support was put to the test a few years ago when the GWPC’s access to federal funds and grants dwindled significantly. Rather than pull out of the project, the states

have forged ahead to continue development of this unique data sharing system. And, as pressures mount on regulatory agencies, the states get more involved in developing the system.

In 2006, GWPC reported fielding 10 projects that were expected to be rolled out in 2009. Four of the projects, modules for data mining, eReports, ePermits, and water quality tracking, have been developed and tested in one to four pilot states. The remaining modules include hydraulic fracturing, CO₂ geosequestration, field inspection modules, public education and outreach, application upgrades and re-release cycles, MIT study and national Class II report, partial primacy, and Class II peer review. RBDMS is being upgraded to incorporate .NET

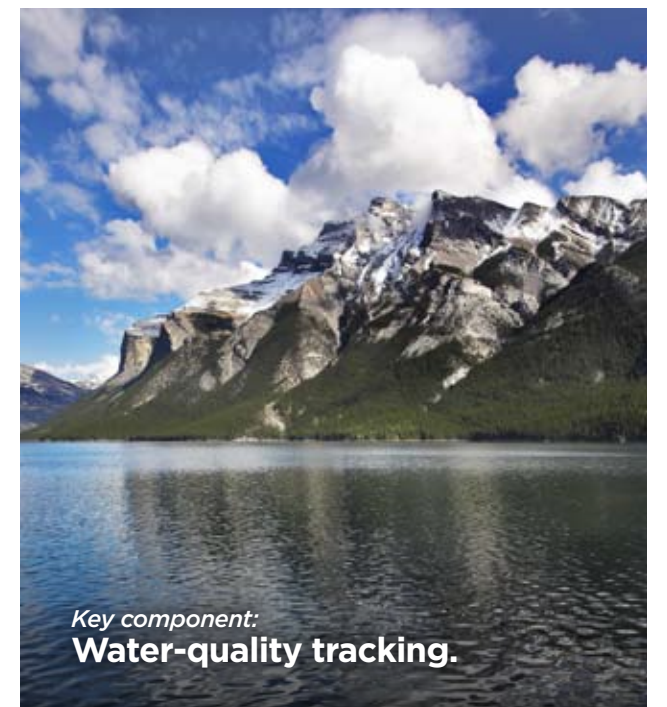


“You want to build it once and reuse it multiple times. So you develop a basic framework with the proper requirements so that the same pages the operator will use to submit data are the same pages the agency will review to approve or monitor.”

Marc Fine,
*IT manager, Colorado Oil and Gas
Conservation Commission*

technology, which will be installed in Mississippi and Oklahoma.

The water-quality tracking project required the integration of GIS data, customization for coal mines, and an application for tracking produced water quality related to production of natural gas from coal seams. Development work for ePermits included developing a national schema, coordination with the BLM for data transfers, and development of web services with the addition of batch submittal to existing installs. Colorado, Kentucky, Alabama and Alaska piloted the single-submittal web forms. The application enables an operator to submit all the information necessary to permit a well, from environmental impact, to well design, and so forth in one submittal. It enables the recipient agency to parse and accept the file and process it as needed. The work on eReports is dependent on the work of ePermits, because it adopts the same data model.

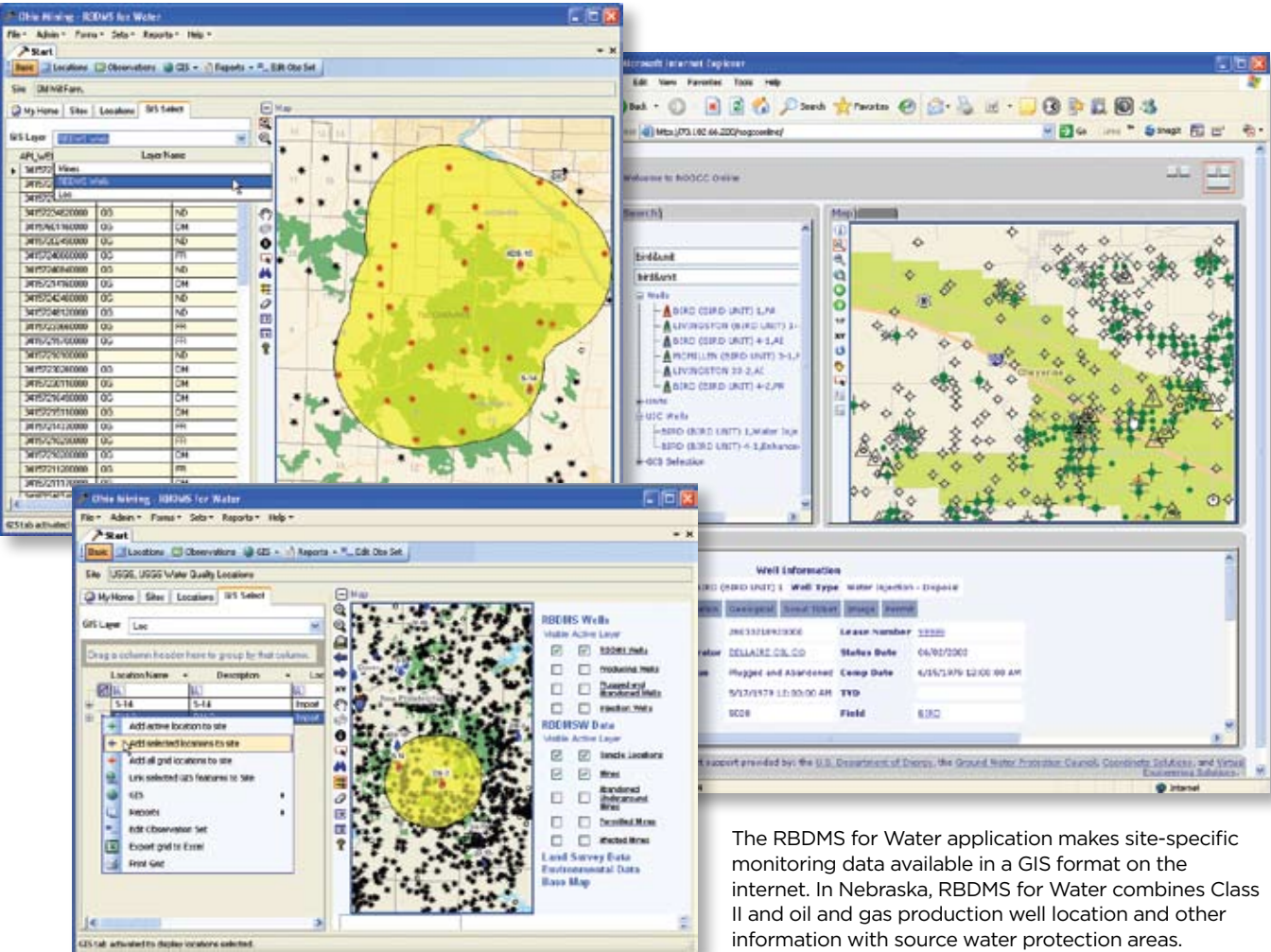


Key component:
Water-quality tracking.

Technology enables operators to submit all the information necessary to permit a well, from environmental impact to well design, in one step. This same technology also creates efficiency for the permit agency, with each report adopting the same data model.

ANTICIPATED USES OF A **GEOGRAPHICAL INFORMATION SYSTEM (GIS)** INCLUDE:

- Agencies' ability to track baseline water quality and quantity data to evaluate permit applications and application revisions.
- Agencies' ability to overlay source water protection areas on oil and gas well, UIC well, and mine data in an online GIS format to identify priority inspection needs.
- Oil and gas operators and mine owners will be able to query the database through the Web to track compliance with water information reporting requirements.
- Operators' contracting laboratories will be able to submit their water quality reports to agencies through the Web service application in EPA-mandated formats.



The RBDMS for Water application makes site-specific monitoring data available in a GIS format on the internet. In Nebraska, RBDMS for Water combines Class II and oil and gas production well location and other information with source water protection areas.

As Stan Belieu noted, the project embraces states at all levels of involvement. There are some states just running in place with very basic systems, somewhat apprehensive of the viability. Others have used a few of the applications, but in states where oil and gas activity is minimal the need for more robust applications isn't there. Some states, like Pennsylvania, suddenly found themselves in need of rapid adoption with the increase in new unconventional development in the Marcellus Shale.

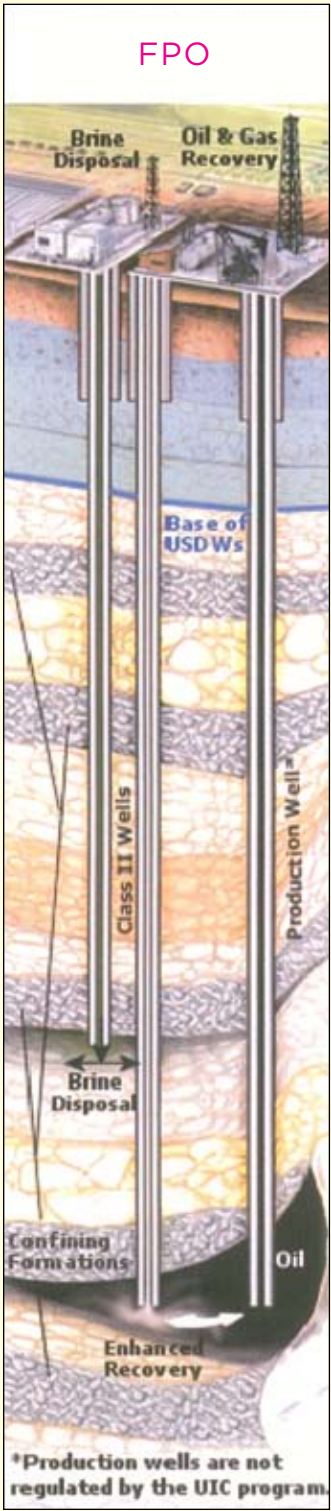
RBDMS is based on the development of concepts or templates that address the well lifecycle. It thrives on technology transfer and information exchange with regulatory agencies, both state and federal, and an industry user base. Work group meetings involving all parties have been successful in meeting the needs of industry and regulators. A case in point is the issuance of permitting and monitoring Class II injection wells. Where states have primacy from the EPA, they assume this responsibility. As more injection wells come online, more responsibilities and costs are incurred, but not necessarily more budget. RBDMS enables the state regulatory agency to use source water overlays against a map of injection wells referenced to the geologic database from oil and gas activity. This information can be used to prioritize inspections for sensitive wells. Instead of trying to inspect all wells once or twice a year, the agency can focus on more frequent inspections of sensitive wells.

As the environmental issues associated with our energy and water needs and uses intersect at accelerated levels of complexity, RBDMS provides comprehensive and flexible tools for informed decision making and quality resource management. The GWPC made the following statement in its 2006 report, "Projects scheduled for rollout over the next four years will reshape the way agencies, industry and the public think about and manage water and energy resources."

The GWPC is very proud of their work on the RBDMS program and believes that the tool has broad implications for future use: "It changes every notion we have about collaborative effort, the effectiveness of state-driven regulatory capability for energy development and resource protection, and funding consortiums in the public sector. RBDMS is emerging as the mission critical tool for environmental protection and resource management in the country, and with it the ratification of the role and capability of the states in directing this tool."

RBDMS enables the state regulatory agency to use source water overlays against a map of **injection wells** referenced to the geologic database from oil and gas activity to help prioritize inspections of sensitive wells. Creating more efficient processes allows agencies to be more cost effective.

SUMMARY





Collectively Representing the States.

INTERSTATE OIL AND GAS COMPACT COMMISSION
900 NE 23RD STREET, OKLAHOMA CITY, OK 73105

THE JOURNAL OF THE INTERSTATE

OIL & GAS COMPACT COMMISSION

groundwork

OCTOBER 2009

INSIDE: ORPHANED & ABANDONED WELLS: INNOVATIVE SOLUTIONS

*Mature wells becoming viable.
Increasing production.
Restoring the land.*



Collectively Representing the States.

Funded by the U.S. Department of Energy.



About the IOGCC

The Interstate Oil and Gas Compact Commission is a multi-state government agency that promotes the conservation and efficient recovery of our nation's oil and natural gas resources while protecting health, safety and the environment. The IOGCC consists of the governors of 38 states (30 members and eight associate states) that produce most of the oil and natural gas in the United States. Chartered by Congress in 1935, the organization is the oldest and largest interstate compact in the nation. The IOGCC assists states in balancing interests through sound regulatory practices. These interests include: maximizing domestic oil and natural gas production, minimizing the waste of irreplaceable natural resources, and protecting human and environmental health. The IOGCC provides an effective forum for government, industry, environmentalists and others to share information and viewpoints, to allow members to take a proactive approach to emerging technologies and environmental issues. For more information visit www.iogcc.org or call **405-525-3556**.

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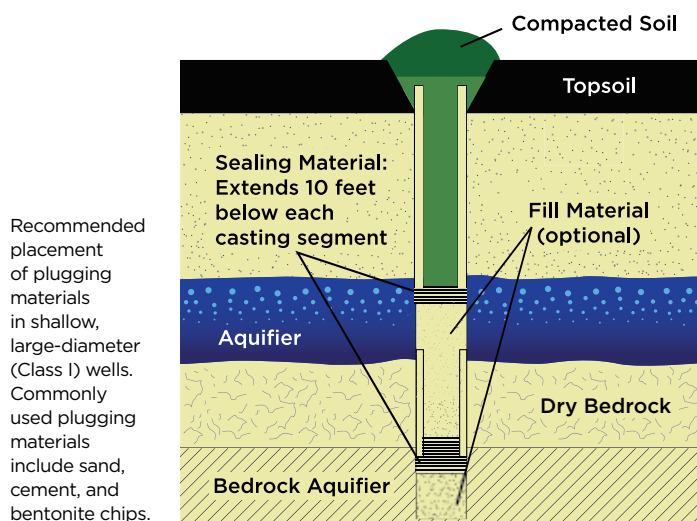
“This is a tremendous opportunity to protect the environment in this beautiful state park, and potentially throughout northwestern Pennsylvania, where thousands of these abandoned, orphaned wells exist.”

– Kathleen A. McGinty,
Pennsylvania Secretary of Environmental Protection



INTRODUCTION

The final, **critical step** oil and gas operators must take to prevent surface and groundwater contamination when a well reaches the end of its productive life is plugging the well so that it may be safely abandoned. A properly cased and cemented well prevents fluids from migrating between formations or to the surface.



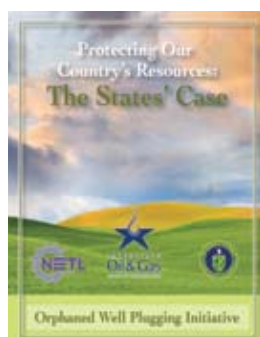
The vast majority of wells drilled in the United States have been correctly plugged under rigorous state regulations and enforcement efforts that continue to this day. These wells pose no threat to the environment. Unfortunately, many states have a small percentage of wells that are unplugged or improperly plugged. In many of these wells, there is no known or financially solvent owner. These wells are typically known as orphaned wells. The majority of these wells are shallow and pre-date regulatory programs. Others are the legacy of numerous boom and bust cycles and

sometimes ignorance on the part of oil and gas producers. Some orphaned wells date back to the 19th Century, when drillers plugged wells with tree stumps, mud, or whatever else was available – if they bothered to plug the well at all. More recent orphaned wells are the result of a bust in the 1980s that left many oil and gas producers bankrupt.

In recent years, states have taken measures to ensure that insolvent operators don't leave taxpayers holding the bag when they go bust. Higher bonding requirements, stiffer penalties, and sending field inspectors to witness the actual plugging procedure all help to ensure that abandoned wells are properly sealed.

The Interstate Oil and Gas Compact Commission (IOGCC) has been involved in a number of studies and has issued numerous reports over the last two decades regarding orphaned, abandoned, and idle wells. Because states use different formulas and definitions for their calculations, and because previously unknown wells are located while others are plugged, the number of orphaned and abandoned wells is an estimate that changes from year to year. The IOGCC defines orphaned wells as those that have no known or solvent owner. The term *plugged and abandoned well* refers to those that are properly plugged. Either of these types of wells may or may not be capable of further production. A 2008 survey put the number of orphaned wells awaiting plugging or restoration at approximately 50,000 nationwide.¹ To support the conservation of natural resources and to protect the environment, IOGCC and state oil and gas regulators want orphaned wells returned to production

where possible, properly shut-in to allow production at a later time if necessary, or properly plugged and the site reclaimed.



¹ The most recent IOGCC report, *Protecting Our Country's Resources: The States' Case*, reflected orphan and idle statistics for calendar year 2006.

Orphaned Well

Orphaned wells have no known or solvent owner and may or may not be capable of further production.



Plugged and Abandoned Wells

The definition of an abandoned well varies from state to state, but usually refers to a well that has been plugged properly and may or may not be capable of further production.



Idle Well

An idle well is one that is not producing and has not been plugged for any number of reasons.



Orphaned wells that predate regulation often go unnoticed because their locations were never recorded.

Early wells, which may be 100 or more years old, were shallow, by modern standards, and are almost never a major risk.

According to a 1992 IOGCC study, “very few health, safety, or environmental problems associated with these (pre-regulatory) wells are reported in any given year.”² States bear the burden of plugging and site restoration that in many cases predates the scientific knowledge required to avoid the hazards posed by orphaned wells.

Post-regulatory orphaned wells present different issues. Newer, deeper wells can pose both physical and environmental hazards, because hydrocarbons, salts, and ground water migrate. An unplugged well creates a conduit allowing these materials to mingle, either contaminating below ground aquifers and water wells or seeping to the surface to contaminate fields, waterways, or ponds. Beyond the contamination, surface seeps can accelerate the risk and ferocity of wild fires. As unplugged wells deteriorate over time, they can cave in on themselves or give way to unsuspecting animals and humans. Unplugged wells also might allow water and salt migration to contaminate petroleum reserves. Casing and sealing hydrocarbon-producing formations, brine formations, and freshwater formations prior to installing a



An unplugged well creates a conduit

allowing hydrocarbons, salts, and ground water to mingle. This mixture can seep to the surface and accelerate the risk and ferocity of wild fires.

Casing and sealing hydrocarbon-producing formations, brine formations, and freshwater formations prior to installing a cement plug ensures that fluids do not migrate between formations or travel up the wellbore to contaminate soil and water on the surface.

² A Study of Idle Oil and Gas Wells in the United States. IOGCC and DOE, 1992.

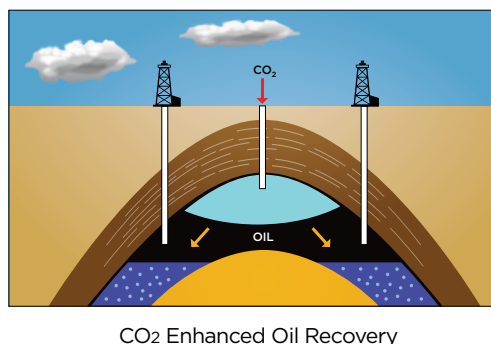
cement plug ensures that fluids do not migrate between formations or travel up the wellbore to contaminate soil and water on the surface.

Also at issue with post-regulatory wells is the potential for further production or use as injection wells in enhanced recovery projects. New

exploration and production (E&P) technologies sometimes can be used to make wells that were abandoned as dry holes in the past into solid producers today. Using technology to increase production of marginally producing wells and to bring orphaned wells into production when possible is an important tool that state oil and gas regulators value in their efforts to conserve the nation's energy resources. Primary recovery from wells typically yields only about 10% of the oil in place; secondary recovery methods such as waterflooding boost recovery to 20–40% of a reserve; and enhanced recovery techniques allow production of more than 60% in some cases.³

The states long have recognized their duty to locate and plug orphaned wells or return them to production and to work diligently to ensure the mechanical integrity of idle wells – both to protect the environment and to minimize the state's liability due to an operator's financial insolvency. The cost to plug an orphaned well varies widely from state to state and according to fluctuations in material and labor costs and other factors including a well's depth and condition. Recent estimates range from a low of about \$2,000 to a high of around \$40,000, with most falling between \$6,000–\$12,000.⁴

Section 349 of the Energy Policy Act of 2005 (EPACT) provides for the establishment of a program to provide technical and financial assistance to oil and gas producing states to facilitate remediation of environmental problems caused by orphaned or abandoned oil and gas exploration or production well sites on state or private land. The Act endorses the Secretary of Energy to work with the states, through the IOGCC, to develop a program that quantifies and mitigates



environmental risks associated with onshore production. The program must include a mechanism to facilitate (a) identification of persons currently providing a bond or other form of financial assurance for an oil or gas well that is orphaned or abandoned, (b) criteria for ranking orphaned

or abandoned well sites, (c) information and training on best practices for remediation of different types of sites, and (d) funding of state mitigation efforts on a cost-shared basis. The act authorizes that \$25 million per year for fiscal years 2006 through 2010 be appropriated to carry out these activities and the Federal Reimbursement for Orphaned Well Reclamation Pilot Program.

To date, however, no funds have been appropriated to assist the states, but plugging activities continue, albeit at a much slower pace than envisioned with the anticipated EPACT funding. The IOGCC has developed a model framework for disbursement of federal funding, which could be applied should plugging funds be appropriated in the future. The IOGCC also worked with member states to develop a model prioritization schedule, published in 2008, that states can use to rank orphaned wells for plugging according to various risk factors.

The average cost to plug an orphaned well varies widely from state to state.
Recent estimates range from \$6,000 to \$12,000.

Additionally, an online orphaned well prioritization “widget” that uses the model schedule is under development. This tool, which sends a report via e-mail, will be available to regulators, industry members, environmental groups, and private citizens – all of whom have a stake in seeing orphaned wells located and plugged properly.

³ www.fossil.energy.gov/programs/oilgas/eor/index.html accessed on 4/17/2009
⁴ Protecting Our Country's Resources: The States' Case. IOGCC/NETL 2008.



Most oil and gas producing states have established plugging funds derived from a variety of sources—including levies, assessments, bonds, or taxes—that in nearly every case are tied inextricably to the oil and gas industry. When market prices are high, these funds tend to expand (depending on a state’s budget allocations), but invariably drop when market prices fall. Plugging funds are adequate in some states, like Arizona, that report no orphaned wells because oil and gas E&P is relatively small and occurred in a post-regulatory environment. States with a longer history of oil and gas development generally find the funds they have available to plug wells stretched to the limit. Texas, for example, has plugged almost 35,000 wells since 1984 at a cost of more than \$163 million, yet the waiting list for plugging as of October 2009 is 8,846 orphaned wells. Kentucky estimated its number of orphaned wells at 12,660, and Pennsylvania, considered the birthplace of the U.S. oil industry, had 8,846 wells on its waiting list that year. New York had 4,717

wells on its plugging list. On the other side of the ledger are states with significant production, such as North Dakota, that have only five wells wait listed and Alaska, with nine that are tributes to effective and efficient processes employed by states.

NUMBER OF WELLS THAT NEED PLUGGING (by state)

Alabama	3
Alaska	9
Kentucky	12,660
New Mexico	190
Pennsylvania	8,827
Texas	8,846

*Based upon a 2008 calendar year survey conducted by the IOGCC

The number of orphan wells needing to be plugged varies greatly from state to state.

Many states use a creative combination of penalties and incentives to reduce the number of orphaned wells. Some states encourage oil and gas operators to test wells in the hope that some might be brought back into production. As noted earlier, enhanced recovery techniques allow production from wells that once were considered dry holes. Actually, “dry hole” is a misnomer for a well that does not produce sufficient volumes of oil or gas to be economically feasible. Higher prices and technologies that raise production are the economic cure.

California has a program that encourages operators to adopt its orphaned wells. Called a “three-way agreement” because the operator must gain consent of the mineral owner(s) and the state Oil and Gas Supervisor, the program allows an operator to test an orphaned well for 90 days with no bonding requirement or liability, provided no mechanical changes are made to the well. After the 90-day “test drive,” an operator must legally acquire the well and post bond coverage, or walk away without incurring plugging costs. To date, there have been 23 agreements, some covering multiple wells, and about 50 wells have been returned to production. The program played an important role in reducing California’s inventory of orphaned wells from more than 900 to about 300, significantly reducing overall liability for the state.

Kentucky and some other states offer reduced severance taxes on orphaned wells that are returned to production. The Bluegrass State also has a program that allows test permits for orphaned wells. To date, Kentucky has received 694 testing permit applications and approved 550 of them, successfully returning 41% (223) of these orphaned wells to production and saving approximately \$669,000 in plugging costs.

A partnership between the Pennsylvania Department of Environmental Protection (DEP) and two seniors groups identifies orphaned wells for plugging. The Pennsylvania Senior Environment Corps (PaSEC) is a statewide network of seniors who monitor Pennsylvania’s water resources. The Environmental Alliance for Senior Involvement (EASI) is a nonprofit coalition

ORPHAN WELL TESTING PROGRAMS

California

- Under California’s “adopt a well” program, prospective operators can enter into a three-way agreement (the owner of the mineral rights, the operator and the state) to test an orphan well for up to 90 days without incurring any liability for plugging the well.
- If the test is successful, the prospective operator can adopt the well by posting a bond and becoming its permanent operator.
- If the test is unsuccessful, the prospective operator can walk away from the agreement with no liability incurred.

Kentucky

- An operator interested in testing a well files a simple permit application and a small fee.
- Once the testing permit is approved, the operator has 60 days to complete the test, under the strict obligation that the operator may not drill deeper or open new production zones during the test.
- Should the test not indicate sufficient production potential, the operator can walk away with no liability.
- If the test is successful and the operator wants to assume the well, the operator requests the well be transferred to his name and he posts a bond.

of environmental, aging, and volunteer organizations. EASI typically partners with national, state, and local public and private organizations to provide opportunities for seniors to play an active, visible role in improving the environment in their communities.

The partners have developed a pilot program that trains and equips senior volunteers to locate and mark orphaned wells in Oil Creek State Park. "This is a tremendous opportunity to protect the environment in this beautiful state park, and potentially throughout northwestern Pennsylvania, where thousands of these abandoned, orphaned wells exist," said Pennsylvania Secretary of Environmental Protection Kathleen A. McGinty. "Sinkholes can develop around these old wells, presenting a danger to hikers, hunters, and all visitors to Oil Creek State Park."

In Pennsylvania, thousands of oil and natural gas wells were dug in rural northwestern parts of the state from the latter part of the 19th Century on. Prior to state environmental laws, these wells often were abandoned once they ceased to be financially viable for their owners. These wells now pose physical and environmental danger, yet most are located in wilderness areas amid rugged terrain and are difficult to find, which is where these senior volunteers come in.

Senior volunteers are provided with many tools, including walkie-talkies to communicate to park personnel when they find abandoned well sites.

EASI trains PaSEC volunteers to find wells and mark their location using handheld GPS units. The volunteers are provided with topographical maps, poles, flags to mark the well sites, orange vests, heavy pants to protect them from injury from the wilderness, and hiking boots. They also are given portable radios and walkie-talkies to communicate with park personnel. The Pennsylvania



The Environmental Alliance for Senior Involvement (EASI) is a nonprofit coalition of environmental, aging, and volunteer organizations.

Department of Conservation and Natural Resources provides technical assistance and computer software for uploading information gathered from the GPS units in the field. Once a well is located and marked, environmental officials inspect the site and assess what action, if any, needs to be taken to protect the environment.

"This program is a wonderful chance for me and the rest of our group to spend time in the beautiful outdoors, while making a meaningful contribution to the community," said John Kolojechick, one of the senior volunteers.

By June 2007, the volunteers had found and marked more than 317 orphaned wells in Oil Creek State Park. With the pilot program proving so successful, the project alliance moved forward to launch a second phase, with an additional \$20,000



By June 2007, volunteers had found and marked more than 317 orphaned wells in Oil Creek State Park.

in funding and the desire of the seniors to increase the area of interest and to build participation in the program. Four areas were added to the project to include some game lands and forestry preserves. The groups have logged hundreds of volunteer hours and spent a mere \$60,000. More than 225 of these wells

have been plugged, and now a third phase is in the works.

In 1993, leaders representing Oklahoma's oil producers and royalty owners, working with the Oklahoma Legislature, formed the Oklahoma Energy Resources Board (OERB). Oklahoma's natural gas producers joined soon after. At the heart of OERB's mission is the ongoing commitment to restoring Oklahoma's orphaned and abandoned well sites left by operators who have since disappeared. Site restoration includes (1) the removal of equipment, concrete, trash, and debris; (2) soil erosion and scarring repair; (3) the removal of hydrocarbons; (4) closing of pits; and (5) the removal of lease roads and location pads (OERB 2008). Funded through a voluntary assessment paid by producers and royalty owners on the sale of oil and natural gas in Oklahoma, OERB's environmental restorations cost landowners and taxpayers nothing. Since 1994, Oklahoma's oil and natural gas producers and royalty owners have voluntarily contributed \$70 million. OERB has restored more than 7,800 abandoned sites.

Michigan established its Orphan Well Fund in 1994 with revenue from a severance tax on the oil and gas industry. Two percent of the tax revenue, but not less than \$1 million, is credited to the fund annually. The money goes toward plugging, response activity, or site restoration at abandoned or improperly closed oil and gas wells. For Fiscal Year 2007-2008, the total cost for plugging, response activity, and site restoration for all projects was \$1,488,058. However, \$183,819 was returned to the fund as a result of sales from well tubing, casing, and equipment, and \$112,000 from the collection of well bonds. Fiscal Year 2007-2008 represented the 13th year that funds were expended from the fund. Sixteen wells were plugged and fifteen oil storage tanks were remediated. Michigan also deposits funds from salvaged equipment from plugged well sites into the fund. In 2009, the value of salvage totaled \$31,464. The Office of Geological Survey posts a list of orphaned wells on its Website. Operators are allowed to take over orphaned wells if they get leases for the minerals under the original drilling unit.

OKLAHOMA'S OIL & NATURAL GAS PRODUCERS & ROYALTY OWNERS. **OERB**

OERB's mission is the ongoing commitment to restoring Oklahoma's orphaned and abandoned well sites left by operators who have since disappeared.

Site restoration includes:

1. Removal of equipment, concrete, trash, and debris
2. Soil erosion and scarring repair
3. Removal of hydrocarbons
4. Closing of pits
5. Removal of lease roads and location pads

STATES HAVE BEEN CREATIVE

in finding ways to reduce the potential for adverse environmental impact by plugging thousands of orphaned wells. They also have conserved resources by encouraging the return of orphaned wells to production. Despite making headway, much more work is required before the danger posed by orphaned wells is history. To ensure that the problem of orphaned wells remains a legacy from the past and not an ongoing problem, states have a variety of regulatory tools at their disposal to prevent premature abandonment of current and future wells. States work on a daily basis to ensure that wells are correctly plugged and abandoned and to identify orphan wells that may present a danger to the environment. Agencies quickly act to address any immediate threat that presents itself – regardless of ownership and liability issues. The process of identifying and remediating past problems will take time, but states are dedicating significant human and financial resources to ensure the protection of generations to come.



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INTERSTATE OIL AND GAS COMPACT COMMISSION

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2010

Investments in Energy Security
State incentives to maximize oil and gas recovery

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ABOUT THE COMMISSION

The Interstate Oil and Gas Compact Commission is a multi-state government agency that promotes conservation and efficient recovery of our nation's oil and natural gas resources while protecting health, safety and the environment.

Representing the governors of 38 states, the IOGCC serves as a forum where state, federal and industry officials can meet to develop sensible solutions to common problems. The Commission's ability to find common ground is unmatched by any other entity dealing with petroleum issues.

The IOGCC also effectively develops regulatory guidance documents and model legislation; conducts studies related to resources, production, research, development and emerging environmental concerns; and provides training and education for industry, the regulatory community, key leaders and the general public.

For more information visit [Groundwork](http://www.groundwork.iogcc.org) – your one-stop source for the latest state-by-state oil and gas regulatory information. www.groundwork.iogcc.org

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Introduction

As part of a cooperative agreement with the United States Department of Energy (DOE) -- entitled *Technology's Impact on Production: Developing Environmental Solutions at the State and National Level* - the Interstate Oil and Gas Compact Commission (IOGCC) presents this catalogue of oil and gas incentive programs to assist government entities in developing and enhancing new and existing oil and natural gas stimuli.

Throughout the report, the term incentive is used more broadly than in traditional context. It is not limited to tax incentives, but includes any program that assists oil and natural gas producers in the efficient recovery of petroleum resources while maintaining health and environmental protection.

State incentive programs are varied, including tax relief for low-volume, economically marginal wells or idle wells brought back into production; petroleum information services provided to the oil and gas industry; and incentives to develop and use new technologies that increase the efficiency of extraction. These programs vary in quantifiable effectiveness.

Incentive programs and services, combined with regulatory practices, are the means through which states protect the environment and stimulate local, regional, and national economies.

New to the report this year is the presentation of incentives by topic and then by individual states.

Research Methodology

The data for this study were gathered a survey of the IOGCC's Council of State Regulatory Officials (CSRO). Necessarily, much of the information is anecdotal and somewhat subjective.

In many instances, the actions of a particular state, or several states, are cited as examples of approaches to challenges faced by oil and gas development. It should be noted that in most of these cases, other oil- and gas-producing states are using similar approaches; the cited examples are deemed to be the most representative or inclusive.

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2010 Incentives by Topic

Coalbed Methane (CBM)

Coalbed Methane (CBM)

CBM, sometimes referred to as “coal seam natural gas,” is methane found in coal seams and produced using unconventional methods. The removal of the methane-rich gas in present in coalbeds is a necessary and sometimes dangerous part of the coal-mining process. In the past, this gas was vented, but advances in technology now make the capture and production of CBM a viable and economic possibility.

State	Alabama
Category	Laws and Regulation
Citation	Ala. Code §§ 9-17-1, 9-17-6, 9-17-12
Title	<i>Drainage or Production Units</i>
Discussion	Allows a second well to be drilled and produced within 80-acre drainage or production units in coalbed methane fields.
URL	http://www.gsa.state.al.us/ogb/statutes.aspx#http://www.gsa.state.al.us/ogb/statutes.aspx
State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §26-58-111
Title	<i>Rates of Tax</i>
Discussion	Coalbed methane wells receive a reduction in severance tax from 5% to 1.5% for 36 to 48 months depending on payout.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm
State	Maryland
Category	Laws and Regulation
Citation	Environment Article 14 Section 112(a)(2)
Title	<i>Location of wells</i>
Discussion	This change allows for placement of coalbed methane wells at 500 feet from unleased property. The previous standard was 1,000 feet, and remains at that distance for all other wells.

Coalbed Methane (CBM)

URL	http://michie.lexisnexis.com/maryland/lpext.dll?f=templates&fn=main-h.htm&cp
State	Pennsylvania
Category	Tax incentive
Citation	58 Pa. Stat. Ann. § 507
Title	<i>Minimum Distance Between Gas Wells</i>
Discussion	HB 2804 amended this section to repeal the 330-foot setback requirement; 2004 Pa. Legis. Serv. Act 2004-171 from the lease line for gas wells to be drilled in areas underlain by deep mineable coal seams. This is to allow the development on smaller parcels while maintaining coordination with coal resources.
URL	http://www.dep.state.pa.us/dep/deputate/minres/oilgas/Act214uc.htm#Sec7
State	Virginia
Category	Tax incentive
Citation	Va. Code Ann. § 45.1-361.22
Title	<i>Pooling of Interest for Coalbed Methane Gas Wells; Conflicting Claims to Ownership</i>
Discussion	Escrow of Coalbed Methane Conflicting Ownership Claims. Established under section 45.1-361.22 of the Virginia Gas and Oil Act, the Virginia Gas and Oil Board may escrow proceeds from a coal seam natural gas production well in a unit where there are conflicting claims to ownership. The Board pays the escrowed proceeds when there is a final decision of a court of competent jurisdiction or agreement among conflicting claimants addressing the ownership of the gas. The Virginia Department of Mines, Minerals and Energy has determined that this section of the Virginia Code has been one key factor that has led to increases in coal seam natural gas production from nominal levels in 1989 to nearly 70 BCF/year.
URL	http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+45.1-361.22
State	Virginia
Category	Laws and Regulation
Citation	Va. Code Ann. § 45.1-361.29.F.2 (amended by 1996 Va. Acts 759 and 765)
Title	<i>Consent to Stimulate Coalbed Methane</i>

Coalbed Methane (CBM)

Discussion	The Virginia Gas and Oil Act requires a producer of coal seam natural gas to obtain consent from the operator of each coal seam located within 750 horizontal feet of a well or 100 vertical feet of any coal seam to be stimulated. A 1997 amendment to this requirement provides that this consent shall be deemed to be granted for any tract where title to the coal is held by multiple owners who have not leased the tract for coal development when the gas operator obtains consent from the co-owners holding a majority interest in the tract. The goal of this act is to allow production of coal seam natural gas when the consent to stimulate cannot be obtained from all co-owners of a tract of coal.
URL	http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+45.1-361.29
State	Virginia
Category	Tax incentive
Citation	Va. Code Ann. § 58.1 - 439.2
Title	<i>Coalfield Employment Enhancement Tax Credit</i>
Discussion	One cent per million BTUs of coal seam natural gas production is credited to the producer.
URL	# http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+58.1-439.2#
State	West Virginia
Category	Laws and Regulation
Citation	GP-WV-1-07
Title	<i>General Water Pollution Control Permit, Permit Number: GP-WV-1-07</i>
Discussion	This General Permit establishes a simple, efficient and economical method for the disposal and regulation of water produced from coalbed methane production that is fully protective of the environment. The Permit strengthens the concept of environmental impact prevention by including provisions for background sampling and sampling in control areas to establish a baseline for evaluating the impact of land applied water on the environment. The Permit incorporates new parameters to the regular sampling process, which will provide information used for soil and groundwater protection and considers more exhaustive monitoring methods for groundwater.
URL	
State	West Virginia
Category	Tax incentive

Coalbed Methane (CBM)

Citation	WV Code Chapter 11, Article 13A-3d
Title	<i>Imposition of tax or privilege of severing coal, limestone or sandstone, or furnishing certain health care services, effective dates for reduction of severance rate for coal mined by underground methods based on seam thickness -- Tax in addition to other taxes</i>
Discussion	Severance Tax exemption/reduction for coalbed methane. Effective January 1, 2009; this exemption is designed to encourage capture of methane gas that would otherwise be vented to the atmosphere.
URL	http://www.legis.state.wv.us/WVCODE/Code.cfm?chap=11&art=13A#13A

Data Access

Data Access

Access to real-time data saves time, energy, and travel at every stage of oil and gas exploration and production. Computer applications allow oil and gas companies to analyze and interact with a variety of data from multiple sources simultaneously. Geographic Information System (GIS) applications use Global Positioning Systems (GPS) and other tools to assimilate information like topography, soil analysis, climate, property ownership maps, and digitized aerial photos to develop prospects and site plans for oil and gas exploration with minimal environmental impact.

State	Alabama
Category	Resource
Citation	Rule 400-1-3-.10 of the Code of Alabama (1975)
Title	<i>Geophysical Logs; Core and Sample Library</i>
Discussion	Alabama’s Oil and Gas Board, working in conjunction with the Geological Survey of Alabama, began in 2001 to generate digital copies of all well geophysical logs, 49,100 in all. Historically, the Oil and Gas Board required operators to submit two hard copies of all logs. The board stored one log as a permanent record and made the other available for copying. Now, only one copy is required, and when the office receives logs, workers scan them for digital storage, reducing both paper and space requirements. Since the public learned that they can access well logs digitally, orders for those files have far exceeded requests for paper copies (IOGCC, 2008). Alabama is also working to add digital files of other historic documents and scanning new files as they come in to further streamline operations, and staff is working to develop online permitting and reporting capabilities. The state believes that having more information digitally accessible, especially well logs, encourages oil and gas companies to spend their exploration dollars in Alabama rather than another state that has incomplete or inaccessible data. The Geological Survey of Alabama maintains a core and well sample library that includes cuttings from 4,000 oil and gas wells, core from 1,700 oil and gas wells, cuttings from 2,800 water and stratigraphic test wells and core from 350 industrial mineral core holes. Rules and regulations of the Oil and Gas Board require that exploration companies submit cores and drill cuttings following the completion of wells. Rule 400-1-3-.10 of the Code of Alabama 1975 states in part that “a complete set of cuttings, correctly labeled and identified as to depth, shall be filed with the board within 30 days from the time of completion of any well unless otherwise approved by the supervisor. If cores are taken, a complete set of cores, either whole or at least quarter slabs, correctly labeled and identified as to depth, shall be filed with the board within six months from the time of completion of any well unless otherwise approved by the supervisor.” The facility has four viewing rooms for use by operators and researchers. Goals: To encourage oil and gas production by making useful data available to producers and to counteract the loss of infrastructure in the independent industry

Data Access

URL	
State	Arkansas
Category	Resource
Citation	
Title	<i>Fayetteville Shale Natural Gas -- Reducing Environmental Impacts (Website)</i>
Discussion	The University of Arkansas and Argonne National Laboratory developed a web-based software application designed to help small E&P companies reduce environmental impacts while developing the low-permeability, tight gas shales of the Fayetteville Shale. Developers designed the tool to help producers navigate federal and state regulatory requirements and evaluate alternative leasing layouts to manage development with an eye toward environmental protection. ("Fayetteville Shale: Reducing the environmental impact of natural gas development")
URL	http://lingo.cast.uark.edu/LINGOPUBLIC/
State	California
Category	Resource
Citation	
Title	<i>Web-based Access to Data and Information</i>
Discussion	California's Department of Oil, Gas Geothermal Resources offers comprehensive web-based access to data and information. Online mapping, online production and injection data, and online well record searches can all be conducted from their web site.
URL	
State	Kansas
Category	Resource
Citation	
Title	<i>Simplified On-Line Automated Reporting (SOLAR)</i>

Data Access

Discussion	The Kansas Corporation Commission (KCC) has been working with the University of Kansas on a Website application that eventually will link operations between the Kansas Geological Society, the Department of Revenue, county appraisers, and the Commission. Operators can create their own account online that they can use to file for drilling permits, check the status of applications, report revenues, and other tasks that once required paper and a trip to the office. The project, which Kansas calls SOLAR for Simplified On-Line Automated Reporting, has been extremely successful. Implemented in the spring of 2008, the program was receiving half of the permit applications online by September. According to Doug Louis, Director of the KCC Conservation Division, the success lies in careful beta-testing to work out glitches before the roll-out of the product. Louis says that the system cuts down on the number of calls that office personnel must handle. Another benefit of the system is accuracy; SOLAR has a built-in “dummy check” that will not allow a permit application to go forward online if the location does not match a location on the system. (IOGCC, 2008)
URL	https://solar.kgs.ku.edu/welcome.cfm
State	Kansas
Category	Resource
Citation	Kan. Stat. Ann. § 76-322
Title	<i>Kansas Geological Survey</i>
Discussion	The Kansas Geological Survey (KGS) conducts research and provides information about the state’s petroleum resources. KGS conducts programs for the petroleum industry so the state will continue to enjoy the benefits of revenue generated by the industry and provides the petroleum industry with the benefits of research and information, as the state land grant schools provide support to the agricultural industry. This is to encourage the development of natural resources of economic value. Impact: Oilfields have been discovered based on KGS research. The KGS is widely recognized as being the source of much petroleum information and for its work on problems posed by the industry. The survey frequently appears before legislative committees to support tax incentives and provides technical assistance to the industry.
URL	
State	Kentucky
Category	Resource
Citation	
Title	<i>Kentucky Geological Survey, University of Kentucky</i>

Data Access

Discussion	The Kentucky Geological Survey has an electronic library of scanned plats, completion reports, logs, and plugging affidavits, and will soon have flowlines and gathering lines.
URL	
State	Louisiana
Category	Resource
Citation	
Title	<i>SONRIS and Interactive Haynesville Shale Mapping Site</i>
Discussion	Online production reporting, well database access (SONRIS), GIS Interactive Map system, and a wide variety and large quantity of information are available through the Office of Conservations Website. The Louisiana Haynesville Shale Website concerns hydraulic fracturing in the Haynesville Shale and offers interactive maps, GIS data download site, FAQs, and other pertinent information.
URL	http://dnr.louisiana.gov/haynesvilleshale/
State	Michigan
Category	Resource
Citation	
Title	<i>West Michigan University Core Repository</i>
Discussion	The repository offers electronic submittal of hydrocarbon production reporting. Downloads and information can be found at the Office of Geological Survey.
URL	
State	Nebraska
Category	Resource
Citation	
Title	<i>Commission Website</i>

Data Access

Discussion	The Nebraska Oil and Gas Conservation Commission offers an excellent array of data from its Website. Data include shape files of the state and surveyed subdivision in electronic format for use by anyone who uses various software packages to construct maps. Well data is supplied electronically, too, and includes API No., location, KB, log tops, operator, and status. The Commission also provides a LANDSAT study of Nebraska and northeastern Colorado that includes lineaments and prospect leads. These data were recently converted to vector files and will be provided after the next update. The Commission, while receiving production reports electronically from many operators, also accepts hard copy filings. Software is being developed to allow for the submission of Drilling Permits and Sundry Notices. Nebraska Geological Survey Information, samples, and cores may be accessed in Lincoln from the Nebraska Geological Survey
URL	
State	Nevada
Category	Resource
Citation	
Title	<i>Nevada Bureau of Mines and Geology (NBMG)</i>
Discussion	The Nevada Bureau of Mines and Geology (NBMG) is the research and public service unit of the University of Nevada and does state geological surveys. NBMG scientists conduct research and publish reports on mineral resources, engineering geology, environmental geology, hydrogeology, and geologic mapping.
URL	
State	New York
Category	Resource
Citation	
Title	<i>New York State Energy Research and Development Authority</i>

Data Access

Discussion	The New York State Energy Research and Development Authority (NYSERDA) was created by the Legislature in 1975 as a public benefit corporation. One goal of NYSERDA's research and development program is to expand the use of indigenous and renewable energy resources. NYSERDA's natural gas agenda has evolved into a multifaceted research and development program structured around the following goals: to help develop new natural gas reserves through innovative exploration methods and reservoir studies; to enhance existing reservoir production by developing or demonstrating new technology and products; to increase natural gas storage from depleted natural gas fields and bedded salt; to improve industry environmental performance; and to conduct extensive industry outreach to educate firms on opportunities for economic production in New York State. Additionally, NYSERDA funds carbon sequestration research.
URL	http://www.nyserda.org/default.asp
State	North Dakota
Category	Resource
Citation	
Title	<i>Commission Website</i>
Discussion	North Dakota provides access to the public via the oil and gas division Website for well files and well data, cores, logs, production and injection volumes, field orders and case files, and streaming audio of cases as they are being held. Witnesses are allowed to provide telephonic testimony at the time the cases are being heard. North Dakota provides electronic submittal of production and injection volumes, permits to drill, and spill reporting.
URL	https://www.dmr.nd.gov/oilgas/
State	Ohio
Category	Resource
Citation	
Title	<i>Ohio Oil and Gas Energy Education Program</i>

Data Access

Discussion	With the passage of Substitute Senate Bill 46 in December 1997, and the approval of independent producers and royalty owners in a required referendum held in March 1998, the Ohio Oil and Gas Energy Education Program (OOGEEP) became effective on April 1, 1998. OOGEEP is a nonprofit organization and is funded entirely by independent producers and royalty owners through an assessment on the production of all crude oil and natural gas in Ohio. The assessment on crude oil is equal to one cent (\$0.01) per gross barrel and one-tenth of one cent (\$0.001) per gross thousand cubic feet of natural gas. All first purchasers of crude oil and natural gas are required to collect the assessment and submit quarterly payments directly to OOGEEP. The OOGEEP Operating Board consists of six independent producers and one member representing a farmer's organization. As outlined in the Ohio Revised Code, they are appointed by the Ohio Department of Natural Resources, Division of Minerals Resources Management's Technical Advisory Council based upon recommendations from a qualified producers organization and an organization representing farmers, such as the Ohio Oil and Gas Association and the Ohio Farm Bureau.
URL	
State	Ohio
Category	Resource
Citation	Ohio Admin. Code 3750
Title	<i>Ohio State Response Commission: Emergency and Hazardous Chemical Inventory Form</i>
Discussion	In lieu of Ohio oil and gas well owners filing hazardous chemical inventory forms under the Community Right to Know Act SARA title III, the well owners can file well completion and annual production statements with the Division of Mineral Resources Management (DMRM). The well completion and annual statement of production forms were amended to include the number of storage tanks associated with the well and the storage capacity of those tanks. This information, along with detailed well information, can be found on the Division's Website (http://www.Ohiodnr.com/mineral/index.html). Additionally, a link is provided in DMRM's Website to the "Oil and Gas Well Emergency Response System" that was developed with U.S. Department of Energy funding through the Argonne National Lab. This site provides emergency responders with well owner contact phone numbers, emergency officials' phone numbers and site specific information on a well by well basis.
URL	http://codes.ohio.gov/oac/3750
State	Oklahoma
Category	Resource
Citation	

Data Access

Title	<i>Oklahoma Small Business Linked Deposit Program</i>
Discussion	Operated through the Oklahoma Treasury Department, the program provides low-interest loans to qualifying businesses, including oil-related businesses. Loans can be used for production enhancements, workovers, and other activities that increase compliance, efficiencies and protect the environment.
URL	
State	Oklahoma
Category	Resource
Citation	
Title	<i>Well Inspection Project</i>
Discussion	The Field Operations Department set a goal three years ago to physically inspect every well in Oklahoma within five years. The estimate at that time was approximately 130,000 wells, which appears to have been too low. As of July 1, 2009, Field Operations had inspected 93,605 wells and, according to records, there are 190,440 left to inspect. However, the department believes that number to be erroneous because records haven't been updated in a timely fashion. In many cases, no well was found at the location because it had been plugged years ago but not entered into the database. As each well is inspected, the GPS reading, well status and type are entered into a spreadsheet which is stored on a portable hard drive for later use in updating the database. It has been determined that many wells had been entered multiple times, causing the database to be incorrect.
URL	
State	Pennsylvania
Category	Resource
Citation	
Title	<i>Well Production Data</i>
Discussion	Pennsylvania regulators are working to change their laws concerning well production data, mud logs, and other information gathered from oil and gas producers. They are using examples from other producing states such as Texas and Oklahoma to show that posting this data will spur business development because operators are more likely to commit the millions of dollars necessary for exploration when they have this information in advance.
URL	

Data Access

State	Texas
Category	Resource
Citation	
Title	<i>Commission Website</i>
Discussion	The Railroad Commission of Texas is integrating its geographic information systems (GIS), business applications, and electronic images of documents. From the GIS Public Viewer, the Commission has established links to allow the public to view oil and gas well attributes, permit information, production data, and well log and completion packet document images. From this foundation, the Commission provides users with flexible access to information and services. Data available from the Texas site include: Drilling Permit Application Query Oil and Gas Proration Schedules Listed by Operator, Gatherer, Purchaser and Field Oil Production and Well Counts Production Adjustment Factor: Each month the Commission reports preliminary Texas production of crude oil and gas based on producer filings of Form PR. Preliminary production totals are key indicators for many industry analysts, who use the data to forecast U. S. oil and natural gas supply and demand and to measure industry activity and performance. Public GIS Map Viewer for Oil, Gas, and Pipeline Data: The Commission's Public GIS Map Viewer for Oil, Gas, and Pipeline Data combines detailed information and location coordinates for oil wells, gas wells, and pipelines from the Railroad Commission's files with base map data from the U.S. Geological Survey 7.5 minute quadrangle maps. These interactive maps were developed using Environmental Systems Research Institute, Inc. (ESRI) ArcIMS software, and they interface with the Commission's Production Data Query Well Logs List for the Public GIS Map Viewer for Oil, Gas and Pipeline Data: The Railroad Commission began scanning well logs in June 2004. Images of all well logs filed with the Commission on or after June 2004 to satisfy the requirements of 16 TAC § 3.16 (Statewide Rule 16) are available through the Website. Drilling Permit (W-1) Subscriptions: Information concerning well records, well counts, distribution tables and by county data are available, as are links to other well-related information.
URL	http://www.rrc.state.tx.us/data/index.php
State	Utah
Category	Resource
Citation	

Data Access

Title	<i>Utah Geological Survey</i>
Discussion	The Utah Geological Survey provides valuable technical publications on oil and gas reserves and also operates the Utah Core Research Center in a 12,000-foot warehouse.
URL	
State	Utah
Category	Resource
Citation	
Title	<i>ePermit</i>
Discussion	The Division of Oil, Gas and Mining has electronic permitting of oil and gas wells and electronic sundry notice approval available to well operators. DOGM's Website is highly regarded for access to oil and gas statistics and detailed well information and logs on the Internet.
URL	http://oilgas.ogm.utah.gov/Quick_Refs/qref_permits.htm
State	Virginia
Category	Resource
Citation	
Title	<i>Data Information System</i>
Discussion	The Virginia Division of Mineral Resources conducts research and provides information about the state's gas and oil resources for the gas and oil industry. The division maintains all information on coreholes, geologic features in gas and oil bearing areas, and a database on wells drilled in the Commonwealth.
URL	
State	West Virginia
Category	Resource
Citation	
Title	<i>Water Withdrawal from West Virginia Streams Guidance</i>

Data Access

Discussion	This application, available on the Department of Environmental Protection webpage, provides oil and gas operators with real-time information for withdrawing water from a stream in an environmentally safe manner.
URL	http://gisonline.dep.wv.gov/wwt/index.html
State	West Virginia
Category	Resource
Citation	
Title	<i>WV DEP Resource Extraction Data Viewer -- RIA to View Oil and Gas Wells Data</i>
Discussion	This application, available on the Department of Environmental Protection webpage, presents permit information as well as location coordinates for oil wells, gas wells, and underground mine boundaries throughout the state of West Virginia. The application uses base map data from the U.S. Geological Survey (7.5 minute quadrangle maps) and 2007 aerial imagery with one meter resolution.
URL	http://gisonline.dep.wv.gov/fogm/index.html

Deep Wells

Deep Wells

Deeper wells are often more cost-prohibitive to operators to produce. By incentivizing deep wells, regulatory authorities encourage higher production levels and the development of new and innovative technologies.

State	Alabama
Category	Tax incentive
Citation	Ala. Code § 40-20-2(a)(7) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	The code applies to offshore wells permitted after July 1, 1998, with a borehole depth greater than 18,000 feet. A privilege tax reduction from 6% (see Ala. Code 40-2-2(a)(5) (1975)) to 4% is available.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
State	Arkansas
Category	Tax incentive
Citation	Ark. Stat. 26-58-101
Title	
Discussion	Wells greater than 12,500 feet measured depth receive a reduction in severance tax from 5% to 1.5% for 24 months.
URL	
State	Louisiana
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633
Title	<i>Rates of Tax</i>
Discussion	This statute reduces severance taxes on the following categories of wells to stimulate exploration and development of horizontal, new discovery, deep gas, or condensate wells. Severance taxes from gas or condensate produced from wells drilled to at least 15,000 feet are suspended from the date of first production for a period of 24 months, or

Deep Wells

	until payout of well cost, whichever comes first. Payout of the well cost shall be determined by the DNR.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. tit. 68, § 1001(I)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Deep Wells. For purposes of qualifying for the exemption, “depth” means the length of a maximum continuous string of drill pipe utilized between the drill bit face and the drilling rig’s kelly bushing. Deep wells spudded between July 1, 1994, and June 30, 1997, and drilled to a depth of 15,000 feet or greater shall be exempt from the gross production tax beginning with the date of first sale for a period of 28 months. Deep wells spudded between July 1, 1997, and June 30, 2002, and drilled to a total depth of 12,500 feet or greater shall be exempt from the gross production tax for a period of twenty-eight (28) months beginning with the date of first sale. Deep wells spudded between July 1, 2002, and June 30, 2009, and drilled between a depth of 12,500 feet and 14,999 feet shall be exempt from the gross production tax for a period of 28 months beginning with the date of first sale. Deep wells spudded between July 1, 2002, and June 30, 2011, and drilled between a depth of 15,000 feet and 17,499 feet shall be exempt from the gross production tax for a period of 48 months beginning with the date of first sale. Deep wells spudded between July 1, 2002, and June 30, 2011, and drilled to a total depth of 17,500 feet or greater shall be exempt from the gross production tax for a period of 60 months beginning with the date of first sale. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 201.057(c)
Title	<i>Temporary Exemption or Tax Reduction for Certain High-Cost Gas</i>
Discussion	Extension on the tax rate reduction for high-cost natural gas wells. There is a 100% reduction for up to 120 months or until cumulative value of exemption equals 50% of drilling and completion cost. The total allowable credit for taxes paid for reporting periods before the date the application is filed may not exceed the total tax paid on the natural gas that otherwise qualified for the exemption or tax reduction and that was produced during the 24 months immediately preceding the month in which the application for

Deep Wells

	certification under this section was filed with the commission. The 78th Texas Legislature removed the filing deadline and made the severance tax exemption permanent. This corresponds to HB 2424.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.201.htm

Discovery Wells

Discovery Wells

An exploratory well that encounters a new and previously untapped mineral deposit -- a discovery well may open up a new field, or it may locate a new and previously unknown producing horizon in an old field (Williams, Meyers, Martin, & Kramer, 2006)."

State	Alaska
Category	Tax incentive
Citation	Alaska Stat. § 43.55.025
Title	<i>Alternative Tax Credit for Oil and Gas Exploration</i>
Discussion	Tax credits for discovery wells
URL	http://www.touchngo.com/lglcntr/akstats/Statutes/Title43/Chapter55/Section025.htm
State	Arizona
Category	Tax incentive
Citation	Ariz. Rev. Stat 42-15001
Title	<i>Assessed Value of Class I Property</i>
Discussion	The Property Tax Reform and Reduction Act, passed by the 42nd Legislature in July 1996, reduced the property tax assessment ratio for all real and personal property used by producing oil, gas, and geothermal interests to 28% of full cash value from 100%. The tax rate will decrease an additional 1% per year until holding at 25% in 1999 through December 2005, 24.5% through December 2006, 24% through December 2007, 23% through December 2008, 22% through December 2009, 21% through December 2010, and 20% beginning from and after December 31, 2010.
URL	http://www.azleg.state.az.us/FormatDocument.asp?inDoc=/ars/42/15001.htm&Title=42&DocType=ARS
State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1001
Title	<i>Tax Incentives — Increased Volume by Enhanced Recovery</i>
Discussion	New discovery oil wells receive a 75% severance tax credit for taxes otherwise due for 5

Discovery Wells

	to 10 years, depending on depth of well.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1001.htm
State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §26-58-111
Title	<i>Rates of Tax</i>
Discussion	New discovery gas wells in conventional source of supply receive reduction in severance tax from 5% to 1.5% for 24 months.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm#http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm
State	Kansas
Category	Tax incentive
Citation	Kan. Admin. Regs. §82-3-312
Title	<i>Gas Allowables and Drilling Unit</i>
Discussion	This regulation increased the daily allowable from 25% of the well's calculated absolute open-flow (AOF) to 50% of AOF. This amended rule also raises the minimum gas allowable from 150 Mcfpd to 250 Mcfpd.
URL	http://www.kcc.state.ks.us/conservation/cons_rr_110308.pdf
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 76-323
Title	<i>State Geological Survey; Chancellor Ex Officio Director; State Geologist, Appointment, Unclassified</i>
Discussion	See Kan. Stat. Ann. § 76-322
URL	
State	Kansas
Category	Tax incentive

Discovery Wells

Citation	Kan. Stat. Ann. § 76-326
Title	<i>Geological Survey with Reference to Natural Products of Economic Importance</i>
Discussion	See Kan. Stat. Ann. § 76-322
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217(b)(1)
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	Natural gas used in injection projects, for fuel in recovery operations, or from a well having an average daily production with a value not more than \$87, is exempt from severance and production taxes.
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217(b)(4)
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	New Wells/New Pools. Production from new pools is exempt from severance tax for 24 months from commencement of production.
URL	
State	Louisiana
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633
Title	<i>Rates of Tax</i>
Discussion	This statute reduces severance taxes on the following categories of wells to stimulate exploration and development: horizontal, new discovery, deep gas, or condensate wells. Severance taxes from certified new or discovery oil and natural gas wells are suspended

Discovery Wells

	from the date of first production for a period of 24 months, or until payout of well cost, whichever comes first. Payout of the well cost shall be determined by the DNR.
URL	#http://www.legis.state.la.us/lss/lss.asp?doc=102399#
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. tit. 68, § 1001(l)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	New Discovery Wells. New Discovery is defined as production of oil, natural gas, or oil and natural gas from: (a) A well, spudded or re-entered prior to July 1, 1997, which discovers crude oil in paying quantities, and is located more than one mile from the nearest oil well producing from the same interval. (b) A well, spudded or re-entered on or after July 1, 1997, and prior to July 1, 2009, which discovers crude oil in paying quantities, and is located more than one mile from the nearest oil well producing from the same interval of the same formation. (c) A well, spudded or re-entered prior to July 1, 1997, which discovers crude oil in paying quantities beneath current production in a deeper producing formation, located more than one mile from the nearest oil well producing from the same deeper interval. (d) A well, spudded or re-entered on or after July 1, 1997, and prior to July 1, 2009, which discovers crude oil in paying quantities beneath current production in a deeper producing interval, located more than one mile from the nearest oil well producing from the same interval of the same formation. (e) A well, spudded or re-entered prior to July 1, 1997, which discovers natural gas in paying quantities, and is located more than two miles from the nearest natural gas well producing from the same interval. (f) A well, spudded or re-entered on or after July 1, 1997, and prior to July 1, 2009, which discovers natural gas in paying quantities, and is located more than two miles from the nearest natural gas well producing from the same interval. (g) A well, spudded or re-entered prior to July 1, 1997, which discovers natural gas in paying quantities beneath current production in a deeper producing interval, that is located more than two miles from the nearest natural gas well producing from the same deeper interval. (h) A well, spudded or re-entered on or after July 1, 1997, and prior to July 1, 2009, which discovers natural gas in paying quantities beneath current production in a deeper producing interval, that is located more than two miles from the nearest natural gas well producing from the same deeper interval. Qualified new discovery wells shall be exempt for a period of 28 months from the date of first sales. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Utah

Discovery Wells

Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(5)(b)
Title	<i>Wildcat Wells</i>
Discussion	No severance tax is imposed on the first 12 months of production from wildcat wells started after Jan. 1, 1990.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102
State	Utah
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(5)(c)
Title	<i>New Development Wells</i>
Discussion	The first six months of production for development wells started after Jan. 1, 1990, is exempt from severance taxes.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102
State	Wyoming
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	Discovery Wells. Wildcat wells are exempt from severance taxes for a period of four years commencing from the date of first production.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2

Economic Stimulation

Economic Stimulation

State	Kansas
Category	
Citation	Kan. Stat. Ann. § 79-32-208
Title	<i>Mineral severance tax; imposition of tax; rate; measurement of production; exemptions</i>
Discussion	Refundable Income Tax Credit for Property Taxes Paid. Working interest owners can receive an income tax credit equal to 75% of the 1998 personal property tax paid on the working interest of an oil lease, from which the average daily production per well is 15 barrels or less. The property tax must have been levied for property tax year 1998 and timely paid during the income tax year in which the credit is taken. By making the credit effective for the tax year beginning after Dec. 31, 1997, immediate relief is available. For taxable years commencing after Dec. 31, 1998, an income tax credit is allowed equal to 50% of the property tax paid for wells producing 15 barrels or less per day when the price per barrel is \$16 or less. The amount of the credit which exceeds the tax liability is refundable.
URL	
State	Virginia
Category	Laws and Regulation
Citation	Va. Code Ann. § 56-265.1 (4)
Title	<i>Direct Sales of Natural Gas by Producers</i>
Discussion	Producers of natural gas may sell directly to as many as 35 commercial and industrial customers without having to become certified as a public utility. Certain public schools are also customers not to be classified as a public utility. The customer limit was raised during the 1997 Virginia General Assembly session from a 10-customer limit. The number of schools are not limited and it does not count against the "fewer than 35" requirement.
URL	http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+56-265.1

Education

Education

State	Alaska
Category	Tax incentive
Citation	Alaska Stat. § 43.55.019
Title	<i>Oil or Gas Producer Tax Credit</i>
Discussion	Credit against tax due for cash contributions is excepted for instruction, research, and educational support services by Alaska University or secondary vocational education, and programs by Alaska school districts.
URL	http://www.touchngo.com/lglcntr/akstats/Statutes/Title43/Chapter55/Section019.htm

Enhanced Oil Recovery (EOR)

Enhanced Oil Recovery

"The increased recovery from a pool achieved by artificial means or by the application of energy extrinsic to the pool, which artificial means or application includes pressuring, cycling, pressure maintenance, or injection to the pool of a substance or form of energy but does not include the injection in a well of a substance or form of energy for the sole purpose of (i) aiding in the lifting of fluids in the well, or (ii) stimulation of the reservoir at or near the well by mechanical, chemical, thermal, or explosive means." The Alberta Oil and Gas Conservation Act, R.S.A. 1970, c.267, section 2(1)(15) (Williams, Meyers, Martin, & Kramer, 2006).

State	Alabama
Category	Tax incentive
Citation	Ala. Code § 40-20-2(a)(2) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Reduces the privilege tax to 4% for incremental production from qualified enhanced oil recovery projects and supplemental enhanced recovery projects. The State Oil and Gas Board of Alabama approves the project and calculates "incremental production" by determining a base production rate.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
State	Alabama
Category	Tax incentive
Citation	Ala. Code § 40-20-2(b) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Exempts natural gas lawfully injected for the purpose of lifting oil or gas from privilege taxes.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1001
Title	<i>Tax Incentives — Increased Volume by Enhanced Recovery</i>

Enhanced Oil Recovery (EOR)

Discussion	EOR projects approved by the Oil and Gas Commission are entitled to a 50% reduction in severance taxes for the incremental volume of oil attributable to the project.
URL	# http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1001.htm#
State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1003
Title	<i>Tax Incentives -- Increased Volume by New Research Technology</i>
Discussion	Incremental production oil due to application of new research technologies approved by the Oil and Gas Commission is exempt from severance tax.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1003.htm
State	Colorado
Category	Tax incentive
Citation	Colo. Rev. Stat. § 39-7-102(2)(a) and (b)
Title	<i>Valuation for Assessment</i>
Discussion	Oil and gas leasehold and lands employing secondary/tertiary recovery or recycling projects are assessed at 75% of the annual gross production value.
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	Secondary/Tertiary Recovery. Incremental production resulting from a tertiary recovery process is exempt from severance and production taxes. Incremental Production. A severance tax exemption for a period of seven years is given to the incremental production resulting from a production enhancement project begun on or after July 1, 1998. Incremental severance and production is defined as production in excess of base production. Base production is the average monthly amount of production for the 12-month period immediately prior to the project beginning date, minus the monthly rate of production decline. The monthly rate of production decline would be determined with reference to the

Enhanced Oil Recovery (EOR)

	same 12-month period used to determine the base production. The monthly rate of production decline is the decline that would have occurred except for the enhancement project. The credit does not apply in any fiscal year if in the preceding calendar year the price exceeded, in the case of oil, \$20 per barrel; or, in the case of natural gas, \$2.50 per Mcf. Language was added to clarify the existing law to include wells that have an established incline in production volumes and for wells that have had casing failures (or for other reasons lack production volumes) immediately prior to the enhancement project.
URL	
State	Louisiana
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633.4
Title	<i>Rates of Tax</i>
Discussion	Tertiary Recovery. No severance tax shall be due on production from a qualified tertiary recovery project approved by the Secretary of the Department of Natural Resources until the project has reached payout. Payout is calculated from the total of production from investment costs; expenses particular to the tertiary project, not to include charges attributable to primary and secondary operations on that reservoir; and interest at commercial rates.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399
State	Mississippi
Category	Tax incentive
Citation	Miss. Code Ann. § 27-25-503 (1)
Title	<i>Severance Taxes -- Privilege Tax Levied; Exemptions</i>
Discussion	The code reduces the assessed tax rate to 3% of the value of the oil produced by an enhanced oil recovery method in which carbon dioxide is used when transported by a pipeline to the oil well, has been expanded to include any other enhanced oil recovery method approved and permitted by the State Oil and Gas Board on or after April 1, 1994.
URL	http://michie.com/mississippi/lpext.dll?f=templates&fn=main-h.htm&cp=
State	Montana

Enhanced Oil Recovery (EOR)

Category	Tax incentive
Citation	Mont. Code Ann. § 15-36-304 (1995)
Title	<i>Production Rates Imposed on Oil and Natural Gas - Exemption</i>
Discussion	Secondary/Tertiary Recovery. Production taxes are reduced for incremental production from secondary and tertiary recovery projects. Incremental secondary production is taxed at 8.5%. Incremental tertiary production is taxed at 5.8%. This incentive is suspended when the price of West Texas Intermediate crude oil exceeds \$30 per barrel for a calendar quarter and reactivates when the price of oil drops below \$30 per barrel.
URL	http://data.opi.mt.gov/bills/mca/15/36/15-36-304.htm
State	New Mexico
Category	Tax incentive
Citation	7-29A-2 NMSA 1978
Title	<i>Enhanced Oil Recovery Tax Incentive</i>
Discussion	Enhanced Oil Recovery Projects. The severance tax is reduced from 3.75% to 1.875% for oil produced from the date of positive production response. OCD approval is required. The incentive does not apply when the oil price is \$28 or more per barrel.
URL	
State	North Dakota
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-05.1
Title	<i>Tax Incentives for Qualifying Secondary Recovery Projects</i>
Discussion	Incremental oil from secondary recovery projects is exempt from extraction taxes for five years, and incremental oil from tertiary projects is exempt for 10 years from the date incremental production commences. All oil from a qualifying secondary or tertiary recovery project is taxed at a reduced rate of 4% once the five- or ten-year exemption has expired. Non-incremental oil from a qualifying secondary recovery project, when its average production level has increased to at least 25% over normal operations for six months, is taxed at a reduced rate of 4%.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf

Enhanced Oil Recovery (EOR)

State	North Dakota
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-05.2
Title	<i>Tax Incentives for Qualifying Tertiary Recovery Projects</i>
Discussion	Non-incremental oil from a qualifying tertiary recovery project that produces at least 15% above normal operations for one month and continues to operate as a qualified project is taxed at a reduced rate of 4%.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001(D)(3)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Tax Exemption for Secondary Recovery Projects. The incremental production from approved secondary recovery properties approved or having an initial beginning date on or after July 1, 2000, and prior to July 1, 2009, is exempt from gross production tax for a period of five years or ending upon termination of the secondary recovery process. The operator is not required to submit capital expenses or project costs. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001(D)(4)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Tax Exemption for Tertiary Recovery. The incremental production from approved tertiary recovery projects begun on or after July 1, 1988, and before July 1, 2009, is exempt from the gross production tax for a period of 10 years or expires upon project payback, whichever comes first. Project payback provides for recovery of capital and operating expenses. Administration expenses and capital expenses of pipelines built to transport carbon dioxide to a project are excluded. The new version of this law extends the sunset from July 1, 2009, to

Enhanced Oil Recovery (EOR)

	July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. Tit.68, § 1357 (32)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Sales Tax Exemption for Electricity Sold for Operation of Enhanced Recovery Methods on a Spacing Unit or Lease. Electricity used for operation of enhanced recovery methods to produce oil is exempt from the sales tax beginning July 1, 2006.
URL	
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 202.054
Title	<i>Qualification of Oil from New or Expanded Enhanced Recovery Project for Special Tax Rate</i>
Discussion	The severance tax is reduced by 50% (from 4.6% to 2.3%) for oil production from new enhanced oil recovery projects and incremental production from expanded projects for 10 years after RRC certification of production response. The RRC certification is a three-step process: first, (Form H-12), the operator seeks approval and area certification for the new/expanded project; second, (Form H-13), the operator seeks RRC certification that the project evidences a positive production response (an increased rate of production attributable to the project); third, (Form H-14), the operator files an annual status report without which the credits are not validated. The application for positive production response certification must be filed within three years of project approval for secondary enhanced recovery, and within five years for tertiary recovery. The 78th Texas Legislature removed the filing deadline and made the severance tax exemption permanent.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.054

Enhanced Oil Recovery (EOR)

State	Utah
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(7)
Title	<i>Enhanced Recovery</i>
Discussion	A 50% reduction in severance tax is available for the incremental production achieved from an enhanced oil or gas recovery project.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102
State	Wyoming
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	EOR. In the case of tertiary production of crude oil resulting from injection of carbon dioxide gas, all Wyoming severance taxes paid on the carbon dioxide gas injected shall be deducted from and allowed as a credit against the severance taxes imposed on the oil produced by the injection.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2

Environmental Audits

Environmental Audits

State regulatory agencies encourage the performance of environmental audits by operators and producers. Environmental audits evaluate the environmental impact of operations. By working cooperatively with operators and producers to find solutions to potential environmental problems, rather than adopting a strictly punitive approach, regulators develop relationships that foster “above and beyond” behavior by the community they regulate.

State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 1-40-3
Title	<i>Qualifications of secretary.</i>
Discussion	See S.D. Codified Laws Ann. § 1-40-33
URL	# http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=1-40-3#
State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 1-40-33
Title	<i>Voluntary Environmental Audits</i>
Discussion	Voluntary environmental audit privilege provides limited immunity for violations of environmental law, rule, regulation, or permit enforced by the Department of Environment and Natural Resources that are discovered and reported to the department within 30 days. The department is prohibited from prosecuting those violations if they are corrected within 60 days. If the violations are not corrected within 30 days, a written compliance schedule may be negotiated between the department and the operator. The department is prohibited from requesting the results of an environmental audit. The environmental audit may not be used as a civil or criminal defense if the producer: (a) willfully and knowingly committed the violation; (b) has a pattern of repeated violations; (c) has not corrected the violation within 60 days of discovery; and (d) has been penalized for a violation within two years of disclosure of the present violation.
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=1-40-33
State	South Dakota
Category	Tax incentive

Environmental Audits

Citation	S.D. Codified Laws Ann. § 1-40-34
Title	<i>Application of environmental audit provisions--Discovery of violations.</i>
Discussion	See S.D. Codified Laws Ann. § 1-40-33
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=1-40-34
State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 1-40-35
Title	<i>Environmental audit subject to discovery--Summary of disclosed violation.</i>
Discussion	See S.D. Codified Laws Ann. § 1-40-33
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=1-40-35
State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 1-40-36
Title	<i>Use of environmental audit as defense.</i>
Discussion	See S.D. Codified Laws Ann. § 1-40-33
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=1-40-36
State	Texas
Category	Tax incentive
Citation	HB 2473
Title	<i>Texas Environmental, Health, and Safety Audit and Compliance Management System Privilege Act.</i>
Discussion	The act encourages businesses to voluntarily comply with environmental and occupational health and safety laws by performing audits and implementing compliance management systems. (1995)
URL	http://www.capitol.state.tx.us/tlodocs/74R/billtext/doc/HB02473F.doc

Environmental Audits

State	Wyoming
Category	Tax incentive
Citation	Wyo. Stat. § 35-11-1105
Title	<i>Environmental Audit Privilege; Exceptions; Burden of Proof; Waiver; Disclosure After in Camera Review; Application</i>
Discussion	This privilege gives oil and gas companies complete immunity from fines and penalties of the Department of Environmental Quality for violations that are reported to the department along with remediation plans.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/18fd2/1a278/1a626/1a64b
State	Wyoming
Category	Tax incentive
Citation	Wyo. Stat. § 35-11-1106
Title	<i>Limitation on Civil Penalties; Voluntary Reports of Violations</i>
Discussion	See Wyo. Stat. § 35-11-1105
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=mainh.htm&cp=wycode/18fd2/1a278/1a626/1a652

Horizontal Drilling

Horizontal Drilling

"...a technique whereby the well is initially drilled vertically and then turned and drilled horizontally at an angle to the vertical of anywhere from 79 degrees to 104 degrees. It encompasses high-angle directional drilling of boreholes with lateral penetration through productive reservoirs. Horizontal drilling allows the wellbore to follow the desired formation (Williams, Meyers, Martin, & Kramer, 2006).

State	Louisiana
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633
Title	<i>Rates of Tax</i>
Discussion	The statute reduces severance taxes on the following categories of wells to stimulate exploration and development of horizontal, new discovery, deep gas, or condensate wells. Severance taxes for oil or gas from horizontally drilled wells or recompletions are suspended from the date of first production for a period of 24 months (extended in 1996 Act 16 and in 1998 Act 7), or until payout of the well cost, whichever comes first. Payout of the well cost shall be determined by the Department of Natural Resources.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399
State	Montana
Category	Tax incentive
Citation	Mont. Code Ann. § 15-36-304 (1995)
Title	<i>Production Rates Imposed on Oil and Natural Gas - Exemption</i>
Discussion	Horizontally Recompleted Wells. Horizontally recompleted oil wells pay a reduced production tax rate on the incremental production for the first 18 months of production after recompletion. This incentive is suspended when the price of West Texas Intermediate crude oil exceeds \$30 per barrel for a calendar quarter and reactivates when the price of oil drops below \$30 per barrel. Wells that have not produced for five years or more are treated, for tax purposes, as new wells (see also: Horizontal Wells section). Horizontal Wells. Production taxes for oil or gas wells that are completed horizontally or for horizontally recompleted oil wells that have not been producing for five years or more are exempt from production taxes, except for the 5% resource indemnity tax for the first 18 months of production.
URL	http://data.opi.mt.gov/bills/mca/15/36/15-36-304.htm

Horizontal Drilling

State	North Dakota
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-06
Title	<i>New Well Exemption for Horizontal Wells</i>
Discussion	Horizontal Wells. Production from new horizontal wells drilled and completed after April 27, 1987, but before April 1, 1995, is exempt from extraction taxes for the first 15 months following well completion, and is then taxed at a rate of 4% thereafter. Oil produced from a horizontal well drilled and completed after March 31, 1995, is exempt for the first 24 months. Affected by price trigger. The NDPC attributes significant increases of drilling activity to this incentive, plus new technology, new finds and good oil prices. The NDIC's statistics show an increase in permits and a decline in the rate of well plugging. As an unexpected benefit, while pursuing new horizontal plays, new plays and new fields have been discovered.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
State	North Dakota
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-10
Title	<i>Horizontal Re-entry Well Exemption</i>
Discussion	Horizontal Re-entry Well Exemption. Oil produced from a horizontal re-entry well during the first nine consecutive months starting with the date the well was re-completed as a horizontal well is exempt from the oil extraction tax. The designation of a horizontal re-entry well is given to a well initially drilled and completed as a vertical well which is re-entered and re-completed as a horizontal well after March 31, 1995. This designation may also apply to the re-entry and recompletion of a vertical well that is classified by the NDIC as a dry hole. Affected by price trigger.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
State	North Dakota
Category	Tax incentive
Citation	N.D. Cent. Code § 57-51-1.3
Title	<i>Horizontal Well</i>
Discussion	Horizontal Well. The first 75,000 barrels of oil produced during the first 18 months after completion, or \$4.5 million gross value of oil produced, from a horizontal well drilled and

Horizontal Drilling

	completed is subject to a reduced tax rate of 2% of the gross value at the well of the oil extracted. Affected by price trigger.
URL	http://www.legis.nd.gov/cencode/t57c511.pdf
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001(E)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Horizontally Drilled Wells. Wells qualifying for this rebate must be drilled in a manner that encounters and subsequently produces from a geological formation at an angle in excess of seventy (70) degrees from the vertical and which laterally penetrates a minimum of one hundred and fifty (150) feet into the pay zone of the formation. For wells producing after July 1, 1994, and prior to July 1, 2002, the rebate shall be 24 months or ending upon payback. For wells producing after July 1, 2002, and prior to July 1, 2009, the rebate shall be 48 months or ending upon payback. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf

Hydraulic Fracturing

Hydraulic Fracturing

State	Alaska
Category	Tax incentive
Citation	Alaska Stat. §31.05.030 (j)(2)(a) - (d)
Title	<i>For Exploration and Development Operations Involving Nonconventional Gas</i>
Discussion	See Alaska Stat. §31.05.030 (j)(1)(a)
URL	
State	Alaska
Category	Laws and Regulation
Citation	Alaska Stat. §31.05.030 (j)(2)(a) - (d)
Title	<i>For Exploration and Development Operations Involving Nonconventional Gas</i>
Discussion	This statute lists stipulations concerning permitting, produced water injection, hydraulic fracturing, waste disposal, and water quality related to nonconventional gas exploration and development.
URL	
State	Ohio
Category	Laws and Regulation
Citation	Ohio Admin. Code 3750
Title	<i>State Emergency Response Commission</i>
Discussion	Emergency and Hazardous Chemical Inventory Form. In lieu of Ohio oil/gas well owners filing hazardous chemical inventory forms under the Community Right to Know Act SARA title III, the well owners will be deemed to have complied by virtue of having filed well completion and annual production statements with the Division of Mineral Resources Management (DMRM). The well completion and annual statement of production forms were amended to include the number of storage tanks associated with the well and the storage capacity of those tanks. This information along with detailed well information can be found on the Division's Web site (http://www.Ohiodnr.com/mineral/index.html).

Hydraulic Fracturing

	Additionally, a link is provided in DMRM's Web site to the "Oil and Gas Well Emergency Response System" that was developed with U.S. Department of Energy (DOE) funding through the Argonne National Lab. This site provides emergency responders with well owner contact phone numbers, emergency officials phone numbers and site specific information on a well by well basis.
URL	http://codes.ohio.gov/oac/3750
State	South Dakota
Category	Laws and Regulation
Citation	S.D. Admin. R. 74:10:09:12
Title	<i>Secretary to Set Maximum Injection Pressure</i>
Discussion	As the rule was written, the maximum injection pressure could not cause new fractures in the formation into which the fluid is injected. In 2007, the DENR changed the rule so the maximum injection pressure does not cause new fractures in the confining zone. The state believes this change is protective of potential underground sources of drinking water, and is consistent with the surrounding states' Class II requirements and EPA guidance.
URL	http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:10:09:12
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 151.355
Title	<i>Water Related Incentives</i>
Discussion	Tax Incentive for Reuse/Recycling of Fracturing Water – The law provides for an exemption from sales, excise, and use taxes, tangible personal property specifically used to process, reuse, or recycle wastewater that will be used in fracturing work performed at an oil or gas well. Corresponds to House Bill 4.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.151.htm#http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.151.htm#151.355
State	Wyoming
Category	Laws and Regulation
Citation	Chapter 3, Section 8

Hydraulic Fracturing

Title	<i>State of Wyoming Hydraulic Fracturing Rules and Regulations</i>
Discussion	The Oil and Gas Conservation Commission has specific rules regarding the hydraulic fracturing permitting and tracking process. Please see the web page for further details either from the Rules and Regulations tab (full rules and regulations language) or from Notices, Memos and Important Details tab (summary of rules), both located on the home page. For a summary of the hydraulic fracturing rules, click the Notices, Memos and Important Details tab, then click on the upper left column for Hydraulic Fracturing Rules and Regulations July 2009.
URL	

Increasing production

Increasing Production

States incentivize increased oil and gas production, often for the purposes of increasing production and mitigating the effects of fluctuating market prices. This assists with preventing unemployment and loss of tax revenue as a result of business stoppages during economic fluctuations.

State	Alaska
Category	Tax incentive
Citation	Alaska Stat. § 43.55.023
Title	<i>Tax Credits for Certain Losses and Expenditures; Tax Credits for Qualified Capital Expenditures</i>
Discussion	
URL	http://www.touchngo.com/lglcntr/akstats/Statutes/Title43/Chapter55/Section025.htm
State	Alaska
Category	Tax incentive
Citation	Alaska Stat. § 43.55.165
Title	<i>Lease Expenditures</i>
Discussion	Qualified lease expenditures are deductible
URL	http://www.touchngo.com/lglcntr/akstats/Statutes/Title43/Chapter55/Section165.htm
State	Alaska
Category	Tax incentive
Citation	Alaska Stat. § 44.55.024
Title	<i>Additional Nontransferable Credits</i>
Discussion	For a calendar year for which a producer's tax liability under AS 43.55.011 (e) on oil and gas produced from leases or properties outside the Cook Inlet sedimentary basin, no part of which is north of 68 degrees North latitude, exceeds zero before application of any credits under this chapter, a producer that is qualified under (e) of this section may apply a tax credit against that liability of not more than \$6 million.
URL	

Increasing production

State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-331
Title	<i>Listing Property for Taxation</i>
Discussion	Property Taxation. This act relates to the property tax valuation of oil and gas properties. Factors to be considered when assessing property taxes include the age of the well, quality of product produced, nearness to market, the cost of operation, the probable life of the well, character, extent and permanency of market, the quantity of product produced, the number of wells being operated and other factors affecting the value of the lease. The act also establishes the method for calculating the property taxes.
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	Natural Gas Severance Tax Reduction. Legislators enacted an annual stepped reduction in severance tax on natural gas from 7% to 4.33% over a three-year period. The final reduction took place in July of 1996.
URL	
State	Oklahoma
Category	
Citation	Okla. Stat. Ann. tit. 68, § 1001(B)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Reduction in the State's Gross Production Tax on Oil. The gross production tax rate levied on oil was changed from a rate of 7% to a variable rate of either 7%, 4% or 1%. Effective with the January 1999 production month, the gross production tax rate on oil is as follows: If the average price of Oklahoma oil as determined by the Tax Commission equals or exceeds seventeen dollars (\$17.00) per barrel, the tax shall be levied at seven percent (7%). If the average price of Oklahoma oil as determined by the Tax Commission is less than seventeen dollars (\$17.00) but equal to or exceeds fourteen dollars (\$14.00) per barrel, the tax shall be levied at four percent (4%). If the average price of Oklahoma oil as determined by the Tax

Increasing production

	Commission is less than fourteen dollars (\$14.00) per barrel, the tax shall be levied at one percent (1%). The average price as computed by the Oklahoma Tax Commission for both oil and natural gas shall be used to determine the applicable tax rate for the third month following production. The new version of this law extends the sunset from July 1, 2009 to July 1, 2012
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Oregon
Category	Tax Incentive
Citation	Or. Rev. Stat. § 324.080
Title	<i>14.001 First \$3,000 in Gross Sales Value</i>
Discussion	An exemption from the tax levied on oil or gas severance is granted for the first \$3,000 in gross sales value of the gross production each calendar quarter from each well.
URL	
State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 10-39A-3.1
Title	<i>Point of imposition of severance tax</i>
Discussion	Natural Gas Sold Out of State. The mineral severance tax is imposed at the time natural gas is sold or consumed, whichever occurs first. This effectively eliminates severance tax on natural gas sold out of state.
URL	S.D. Codified Laws Ann. § 10-39A-3.1# http://S.D. Codified Laws Ann. § 10-39A-3.1#
State	Utah
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(2)
Title	<i>Variable Severance Tax Rate</i>
Discussion	For oil, the severance tax rate is 3% up to and including the first \$13 per barrel, and 5% of the value exceeding \$13 per barrel. The severance tax rate natural gas is 3% for the first \$1.50 per Mcf, and 5% of value above \$1.50.

Increasing production

URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102
State	West Virginia
Category	Legislation
Citation	SB 328
Title	<i>Direct Use Sales Tax Exemption</i>
Discussion	When the exemption from sales tax for contractors was removed in 1989, subcontractors were included for the oil and gas industry, even though contract drillers were still exempt from sales tax on purchases used directly in the production of oil and gas. The 1994 Legislature clarified in Senate Bill 328 that this “direct use” exemption was available also to oil and gas subcontractors.
URL	

Marginal Wells

Marginal Wells

A producing well that requires a higher price per MCF or per barrel of oil to be worth producing, due to low production rates and/or high production costs from its location (e.g. far offshore; in deep waters; onshore far from good roads for oil pickup and no pipeline) and/or its high co-production of substances that must be separated out and disposed of (e.g. saline water, non-burnable gasses mixed with the natural gas). A Marginal Well becomes unprofitable to produce whenever oil and/or gas prices drop below its crucial profit point. On land, this is often but not always a stripper well. (IOGCC)

Stripper Well: An oil well whose maximum daily average oil production does not exceed 10 bbls oil per day during any consecutive 12 month period. Often used interchangeably with the term “Marginal Well”, although they are not the same.

State	Alabama
Category	Tax incentive
Citation	Ala. Code § 40-20-2(a)(3) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Reduces the privilege tax to 4% of value on wells producing 25 barrels of oil or less per day, or 200 Mcf per day of natural gas.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
State	Alaska
Category	Tax incentive
Citation	Alaska Stat. § 38.05.180(f)(6)
Title	<i>Oil and Gas and Gas Only Leasing</i>
Discussion	The statute reduces royalty for oil from platforms in the Cook Inlet Basin that produce less than 1,200 bpd.
URL	http://www.touchngo.com/lglcntr/akstats/Statutes/Title38/Chapter05/Section180.htm
State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1002

Marginal Wells

Title	<i>Tax Incentives — Re-establishment of Inactive Wells and Fields</i>
Discussion	The severance tax is reduced from 5% to 4% for marginal wells, which are defined by the state as wellsthat produce an average of less than 10 barrels of oil per day during any calendar month.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1002.htm
State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §26-58-111
Title	<i>Rates of Tax</i>
Discussion	Marginal Gas Wells. there is a reduction in the severance tax from 5% to 1.25% for conventional sources of supply producing less than 100 Mcf/day and for unconventional and tight sand sources of supply producing less than 250 Mcf/day.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm#http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm
State	Colorado
Category	Tax incentive
Citation	Colo. Rev. Stat. § 39-29-105
Title	<i>Tax on Severance of Oil and Gas</i>
Discussion	Oil and gas income from "stripper wells," i.e., wells that produce an average of 15 barrels or less of oil per producing day or 90,000 cubic feet of gas per producing day, is exempt from severance tax. A tax credit is available for 87.5% of ad valorem tax.
URL	
State	Florida
Category	Tax incentive
Citation	Fla. Stat. Title XIV, § 211.02, and Chapter 86-178 (1986)
Title	<i>Oil Production Tax; Basis and Rate of Tax; Tertiary Oil</i>
Discussion	Marginal/Stripper Wells. The severance tax is reduced from 8% to 5% for oil wells producing less than 100 barrels per day. Stripper gas is taxed at \$0.12 Mcf.

Marginal Wells

URL	
State	Kansas
Category	Laws and Regulation
Citation	Kan. Admin. Regs. §82-3-304
Title	<i>Tests of Gas Wells; Penalty</i>
Discussion	Tests of Gas Wells. This regulation increased the daily minimum gas allowable in Kansas from 150 to 250 Mcf per day and exempts such minimum gas wells from the burden of annual gas well testing (including the required 72-hour shut-in period). It requires that the operator must apply for the exemption and annually report to the Kansas Corporation Commission the well head shut-in pressure for such minimum wells that have been exempted. This includes all coal seam gas wells and conventional gas wells that produce less than 250 Mcf per day. This incentive is designed to minimize the loss of gas production sales and associated expenses of the gas well test (pulling unit time, labor, etc.) for minimum wells.
URL	http://www.kcc.state.ks.us/conservation/cons_rr_110308.pdf
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217(b)(1)
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	Marginal/Stripper Wells. The existing severance tax exemptions for marginal/stripper wells was expanded to increase exemptions and to allow for further increases in exemption amounts if oil prices decrease. The two barrels of oil per day exemption on oil produced from a lease or production unit increased to an average daily production of five. The three-barrel exemption for wells with a completion depth of 2,000 feet or more increased to an average daily production of six barrels per day. Further exemptions were provided for if the price of oil decreases. Oil priced at \$16 or less now has a seven barrel exemption; should oil drop to \$13 per barrel, the exemption is 10 barrels. Tertiary recovery from a waterflood process from wells of 2,000 feet or less now has a six barrel exemption and wells in excess of 2,000 feet have a seven barrel exemption. The exemption is 10 if the oil price reaches \$14 per barrel. Tertiary recovery oil priced at \$16 or less now has an eight barrel exemption and \$14 oil would have a 10 barrel exemption. The exemption for gas severed from a well having a gross value of not more than \$81 per day during a calendar month was increased to \$87
URL	
State	Kansas

Marginal Wells

Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217(b)(2)
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	See Kan. Stat. Ann. § 79-4217(b)(1)
URL	
State	Louisiana
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633
Title	<i>Rates of Tax</i>
Discussion	The statute reduces severance taxes on the following categories of wells to stimulate exploration and development of horizontal, new discovery, deep gas, or condensate wells. Stripper Oil Wells. Severance taxes on the following categories of wells were reduced to stimulate exploration and development: (1) Stripper Oil Wells and Incapable Oil Wells producing less than 10 barrels of oil per day are exempt from severance taxes during any month in which oil prices average less than \$20 per barrel. When oil prices are greater than \$20 per barrel, the severance tax is reduced by 7.5% to 3.125%. Wells producing more than 10 and less than 25 barrels of oil per day with at least a 50% saltwater cut are taxed at 6.25%, a 50% reduction. Marginal Gas Wells. Gas wells producing less than 250 Mcf per day are taxed at a reduced rate of \$0.013/Mcf.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399
State	Michigan
Category	Tax Incentive
Citation	1929 Mich. Pub. Acts 48
Title	<i>Marginal/Stripper Wells</i>
Discussion	Severance taxes are reduced from 6.6% to 4% for production from stripper oil wells. The severance tax rate for all gas production is 5 %. Stripper oil wells are defined by the state as wells with an average maximum daily production less than or equal to 10 barrels per day. Production from marginal oil properties receives the same reduction when average per well production is: 20 barrels or less for properties with average completion depths greater or equal to 2,000 feet but less than 4,000 feet; 25 barrels or less for properties with average

Marginal Wells

	completion depths greater or equal to 4,000 feet but less than 6,000 feet; 30 barrels or less for properties with average completion depths greater or equal to 6,000 feet, but less than 8,000 feet; 35 barrels or less for properties with average completion depths of at least 8,000 feet.
URL	http://legislature.mi.gov/doc.aspx?mcl-act-48-of-1929
State	Montana
Category	Tax Incentive
Citation	Mont. Code Ann. § 15-36-304 (1995)
Title	<i>Production Rates Imposed on Oil and Natural Gas - Exemption</i>
Discussion	Marginal/Mini Stripper Wells (three barrels per day or less). Oil from a well which produces three barrels per day or less is exempt from production taxes, except the 5% resource indemnity tax. A suspension clause eliminates this tax exemption when West Texas Intermediate crude oil prices reach \$38 per barrel for a calendar quarter and reactivates when the price drops below \$38 per barrel. Stripper oil wells are defined as those producing 15 barrels per day or less. Marginal/Stripper Wells (10 -15 barrels per day). The production tax rate on the first 10 barrels produced from a stripper oil well is 5.5%. The production tax rate is 9% on the next 10 to 15 barrels. Lower tax rates are provided for stripper well production when the price of West Texas Intermediate crude oil remains below \$30 per barrel in a calendar quarter. Montana defines a stripper oil well as a well that produces less than 15 barrels per day.
URL	http://data.opi.mt.gov/bills/mca/15/36/15-36-304.htm
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-701
Title	<i>Terms, defined.</i>
Discussion	A severance tax reduction from 3% to 2% is available for oil wells that produce less than 10 barrels per day.
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive

Marginal Wells

Citation	Neb. Rev. Stat. § 57-702
Title	<i>Tax; levy; persons liable; due and payable; lien.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-703
Title	<i>Tax; levy on resources severed; rate.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-704
Title	<i>Taxes; payment; time; statement; filing; form; contents.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive

Marginal Wells

Citation	Neb. Rev. Stat. § 57-705
Title	<i>Tax; remittance; Severance Tax Fund; Severance Tax Administration Fund; created; use.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-706
Title	<i>Tax; security; notice; use.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-707
Title	<i>Reports; payment of tax.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-708

Marginal Wells

Title	<i>Tax; deductions permitted.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-709
Title	<i>Tax; delinquent; action.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-710
Title	<i>Tax; when delinquent; interest; penalty.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-711

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Title	<i>Repealed. Laws 1983, LB 228, §12.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-712
Title	<i>Tax Commissioner; supervise tax collections.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-713
Title	<i>Repealed. Laws 1983, LB 228, §12.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-714
Title	<i>Tax; delinquent; restrain severing resource; Attorney General; county attorney.</i>

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Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-715
Title	<i>Repealed. Laws 1973, LB 527, §2.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-716
Title	<i>Producer; file certificate; contents.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-717
Title	<i>Severance tax collection; Tax Commissioner; powers and duties; penalty.</i>
Discussion	See Neb. Rev. Stat. § 57-701

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URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-718
Title	<i>Tax Commissioner; enforcement; powers and duties; records; requirements.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#
State	Nebraska
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-719
Title	<i>Violations; penalties.</i>
Discussion	See Neb. Rev. Stat. § 57-701
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719#
State	New Mexico
Category	Tax Incentive
Citation	7-29B-1 NMSA 1978
Title	<i>Stripper Well Tax Incentive</i>
Discussion	Marginal/Stripper Wells. The incentive reduces both severance and emergency school taxes for stripper well properties having average daily production of less than 10 barrels or 60 Mcf per eligible well. Severance taxes are reduced from 3.75% to 1.875% or 2 13/16% and emergency school taxes are reduced from 4% to 2% or 3% for gas and from 3.15% to 1.58% or

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	2.36% for oil during periods of low prices (less than \$1.15 and between \$1.15 and \$1.35 per Mcf for gas and less than \$15 and between \$15 and \$18 per barrel for oil).
URL	
State	New Mexico
Category	Laws and Regulation
Citation	N.M. Stat. Ann. § 19-10-5.1
Title	<i>Amendment of Lease to Lower Royalty Rate for Oil Wells Under Certain Conditions</i>
Discussion	State Royalty Reductions. A lower royalty rate (5%) applies to oil wells operated pursuant to a state oil and gas lease if the wells averaged: (i) less than 3 barrels per day for the preceding 12-month period but not more than 5 barrels per day for any month during that 12-month period if producing from shallower than 5,000 feet; and (ii) less than 6 barrels per day for the preceding 12-month period but not more than 10 barrels per day for any month during that 12-month period for production from 5,000 feet or deeper. Certain conditions apply and an application and fee are required.
URL	http://legis.state.nm.us/Sessions/99%20Regular/FinalVersions/house/HB0653.pdf
State	North Dakota
Category	Tax Incentive
Citation	N.D. Admin. Code § 81-09-03-07
Title	<i>Stripper Well Exemption</i>
Discussion	Stripper Well Property Determination (No Trigger). This section outlines the requirements for an operator desiring to classify a property as a stripper well property for the purposes of exempting production from extraction taxes. Oil produced by stripper wells is exempt from extraction taxes. Stripper wells are defined as wells with an average daily production during a 12-month consecutive qualifying period of up to 10 barrels per day at a depth of less than 6,000 feet; up to 15 barrels per day at a depth of 6,000 to 10,000 feet; and up to 30 barrels per day at depths greater than 10,000 feet. Stripper wells must be certified by the NDIC. This section was amended in May 2004 to offer operators the opportunity to reclassify already determined single well stripper properties as another type of property.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
State	Oklahoma
Category	Tax Incentive

Marginal Wells

Citation	Okla. Stat. Ann. tit. 68, § 1001.3a (2008)
Title	<i>Economically At-risk Oil or Gas Leases - Tax Exemptions</i>
Discussion	Economically At-Risk Oil Leases. Operators may apply to the Oklahoma Tax Commission for a rebate of 6/7ths of the gross production tax upon demonstrating that they operate a lease that is economically at-risk. This particular rebate was previously in effect for calendar years 1997 and 1998 wherein it applied only to at-risk oil leases. Effective July 1, 2005, Oklahoma statutes were amended wherein the rebate applies to both at-risk oil and gas leases. The definition of an economically at-risk lease means any lease operated at a net profit or a net loss, which is less than the gross production tax remitted for such lease in a given calendar year. Operators of at-risk leases shall make application to the Tax Commission to certify that they meet the criteria for being at-risk. Upon approval by the Commission, operators shall file a claim for refund of 6/7ths of the 7% gross production tax remitted for the qualifying year. The at-risk rebate is applicable to calendar years 1997, 1998, 2005, 2006 and 2007. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Texas
Category	Laws and Regulation
Citation	Tex. Nat. Res. Code Ann. § 32.067
Title	<i>Marginal Property Royalty Rates</i>
Discussion	The Texas School Land Board may grant a reduced royalty rate for a period of two years for marginally economic state leases. To qualify, the lease must produce an average of 15 barrels per day per well, or an average of 90 Mcf of gas per day per well. Once the reduced rate is granted, royalty rates will not increase for that lease for two years. Additional reductions can be applied for at the expiration of the two-year period. This tax reduction applies when oil prices average less than \$25 per barrel.
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.32.htm#32.067
State	Texas
Category	Laws and Regulation
Citation	Tex. Nat. Res. Code Ann. § 86.091
Title	<i>Marginal Gas Wells and Limits on Well Restrictions</i>
Discussion	The RRC can exempt marginal gas wells from otherwise applicable production limitations if the wells are located in gas fields without special field rules. A marginal gas well is defined in the Texas Natural Resources Code as a gas well incapable of producing more than 250,000 cubic

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	feet of gas per day under normal operating conditions. Prior to this legislation, the RRC was precluded from exempting individual marginal wells that exist in fields with other wells capable of producing above marginal limits. This legislation replaced the RRC's requirement to limit production from gas wells producing more than 100,000 cubic feet of gas per day unless it is a marginal well in a field for which special field rules are not in effect.
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.86.htm#86.091
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 202.057
Title	<i>Incremental Production Incentive</i>
Discussion	Leases with wells that averaged seven BOE (barrels of oil equivalent) a day or less in 1996 are eligible for a fifty percent tax reduction on incremental production. The period from September 1, 1997 through December 31, 1998 will be used to determine any increase in production over the 1996 baseline level. The exemption is granted as long as the price of oil, as judged by the Comptroller, remains below \$25 (adjusted to 1997 dollars). It is suspended if the price reaches \$25 or above for three consecutive months and reinstated when it is below \$25 for three consecutive months.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.058
State	Utah
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(5)(a)
Title	<i>Marginal/Stripper Wells</i>
Discussion	Stripper wells are severance tax exempt unless the exemption prevents the severance tax from being treated as a deduction for federal tax purposes. Stripper wells are defined as wells that produce an average of less than 20 barrels per day for one year, or 60 Mcf or less of natural gas per day for 90 consecutive days.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102
State	West Virginia
Category	Legislation
Citation	HB 2749

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Title	<i>Severance Tax Exemption</i>
Discussion	Imposes a tax equal to 5% of the gross value produced for the privilege of severing natural gas or oil. Effective taxable periods beginning on or after Jan. 1, 2000. An exemption from the severance tax is granted for natural gas provided free to surface owners. The exemption is granted to low-volume wells, producing less than 5 Mcf of natural gas per day or oil wells that produced an average of less than one-half barrel of oil per day during the calendar year immediately preceding a given taxable period. Natural gas or oil produced from a well that has not produced marketable quantities for five consecutive years immediately preceding the year in which the well is placed back into production and begins producing marketable quantities is also exempted for a maximum of 10 years.
URL	
State	West Virginia
Category	Tax incentive
Citation	WV Code Chapter 11, Article 13A-31
Title	<i>Severance Tax Exemption</i>
Discussion	The rule imposes a tax equal to 5% of the gross value produced for the privilege of severing natural gas or oil. Effective taxable periods begin on or after Jan. 1, 2000. An exemption from the severance tax is granted for natural gas provided free to surface owners. The exemption is granted to low-volume wells, producing less than 5 Mcf of natural gas per day or oil wells that produced an average of less than one-half barrel of oil per day during the calendar year immediately preceding a given taxable period. Natural gas or oil produced from a well that has not produced marketable quantities for five consecutive years immediately preceding the year in which the well is placed back into production and begins producing marketable quantities is also exempted for a maximum of 10 years.
URL	http://www.legis.state.wv.us/WVCODE/Code.cfm?chap=11&art=13A#13A
State	Wyoming
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	Marginal/Stripper Wells. Wells which produce an annual average of less than 15 barrels per day while the price of oil is less than \$20 per barrel are taxed at 4% (reduced from 6%). When

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	the price of oil is \$20 or more, wells producing 10 barrels per day or less receive the 2% tax reduction.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2

New Production

New Production

States encourage the responsible development of new plays and fields in order to stimulate local economies.

State	Alabama
Category	Tax incentive
Citation	Ala. Code § 40-20-2(a)(8) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Reduces production and privilege taxes for oil and gas wells permitted on or after July 1, 1996, and before July 1, 2002, except a replacement well for which the initial permit was issued before July 1, 1996. Applicable rate is reduced 50% for five years.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
State	Montana
Category	Tax incentive
Citation	Mont. Code Ann. § 15-36-304 (1995)
Title	<i>Production Rates Imposed on Oil and Natural Gas - Exemption</i>
Discussion	New Wells. Oil or gas production from new wells, or wells that have not produced for five years, are exempt from production taxes, except for the 5% resource indemnity tax, for the first 12 months of production.
URL	http://data.opi.mt.gov/bills/mca/15/36/15-36-304.htm
State	Nevada
Category	Tax incentive
Citation	Nev. Admin.Code § 522.150
Title	<i>Powers and Duties of Division</i>
Discussion	Reduced Administrative Fee for New Production. The amount of the administrative fee that a producer or purchaser of oil or natural gas must pay on new production pursuant to subsection 2 of Nevada Revised Statute 522.150 is one-half cent (five mills) per barrel of oil or per 50,000 cubic feet of natural gas, as appropriate. New production is defined

New Production

	as production from new wells or existing wells completed in new intervals as determined by the Commission on Mineral Resources. Any qualifying well will receive a reduced administrative fee for one full year. Upon completion of a qualifying well, the producer will submit a Form 5, "Well Completion Report." The production date as reported on the Form 5 will be the effective date for the reduced fee.
URL	http://search.leg.state.nv.us/isysquery/irl5136/1/doc
State	North Dakota
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-06
Title	<i>New Wells</i>
Discussion	New Wells. Production from new wells drilled and completed after April 27, 1987, is exempt from extraction taxes for the first 15 months of production and taxed at a rate of 4% thereafter (reduced from 6.5%). Affected by price trigger.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
State	North Dakota
Category	Tax incentive
Citation	N.D. Cent. Code § 57-51.1-03
Title	<i>Exemptions from Oil Extraction Tax</i>
Discussion	Tribal Lands Oil Tax Exemption (No Trigger). Initial production of oil from a well is exempt from extraction tax (6.5%) for 60 months if: the well is located on a reservation; or the well is located on trust land held for a tribe; or the land is held by a tribe at the time this Act was passed.
URL	http://www.legis.nd.gov/cencode/t57c511.pdf
State	North Dakota
Category	Tax incentive
Citation	N.D. Cent. Code § 57-51-02.4
Title	<i>Shallow Gas - Gross Production Tax Exemption</i>
Discussion	Shallow Gas Wells (No Trigger). Shallow gas from new or re-completed wells drilled and completed after June 30, 2003, is exempt from gross production taxes for the first 24

New Production

	months of gas sales.
URL	http://www.legis.nd.gov/cencode/t57c51.pdf
State	Pennsylvania
Category	Laws and Regulation
Citation	PA Act 115
Title	<i>Dormant Oil and Gas Act</i>
Discussion	The purpose of this act is to facilitate the development of subsurface properties by reducing the problems caused by fragmented and unknown or unlocatable ownership of oil and gas interests and to protect the interests of unknown or unlocatable owners of oil and gas. It allows the know owner to proceed with development by establishing a trust for the proceeds due the unknown owner.
URL	http://www.legis.state.pa.us/cfdocs/billinfo/billinfo.cfm?year=2005&sind=0&body=S&type=B&BN=0594

New Technology Usage

New Technology Usage

State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1003
Title	<i>Tax Incentives -- Increased Volume by New Research Technology</i>
Discussion	Incremental production oil due to application of new research technologies approved by the Oil and Gas Commission is exempt from the severance tax.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1003.htm
State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § B-42
Title	<i>Seismic Rules and Regulations</i>
Discussion	This amendment clarified the area covered by a permit with respect to 2-D and 3-D seismic methods. 2-D – permit area is ½ mile on each side of line location, referred to as “2-D seismic line corridor.” 3-D – permit area is based on outline of designated area where shoot will occur. The rule expressly states many operation requirements that previously were located only on the issued permit and also imposes additional operation requirements that were not included in the issued permit. The rule clarifies how notice is to be given, and who is entitled to notice prior to commencement of seismic operations. Entitled to notice are operators within the “area”, surface owners, and surface occupants who are not owners.
URL	
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001(J)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>

New Technology Usage

Discussion	Three-Dimensional Seismic Technology. Operators producing oil, natural gas, or oil and natural gas from a well, the drilling of which is commenced after July 1, 2000, and prior to July 1, 2009, located within the boundaries of a three-dimensional seismic shoot and drilled based upon three-dimensional seismic technology, may apply to the Tax Commission for a rebate of gross production tax paid in the previous fiscal year upon qualifying such well with the Oklahoma Corporation Commission. Qualified projects shall be exempt for a period of 18 months from the date of first sale for seismic shot prior to July 1, 2000. Projects shot after July 1, 2000, and prior to July 1, 2009, shall be exempt for a period of 28 months from the date of first sale. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 202.061
Title	<i>Tax Credit for Enhanced Efficiency Equipment</i>
Discussion	Provides for a severance tax credit for enhanced efficiency equipment installed on marginal oil wells between September 1, 2005, and September 1, 2009. "Enhanced efficiency equipment" means equipment used in the production of oil that reduces the energy used to produce a barrel of fluid by 10 percent or more when compared to commonly available alternative equipment. The term does not include a motor or downhole pump. Equipment does not qualify as enhanced efficiency equipment unless an institution of higher education approved by the comptroller that is located in this state and that has an accredited petroleum engineering program evaluated the equipment and determined that the equipment does produce the required energy reduction.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.061

On-site Use of Produced Oil/Gas

On-Site Use of Produced Oil/Gas

States incentivize on-site use of produced oil and gas to reduce the necessity for venting and flaring or other waste management techniques. On-site use as opposed to venting or flaring encourages the recycling of oil and natural gas that otherwise would have been considered a waste product. Incentivizing the use of produced oil and natural gas reduces emissions while allowing for enhanced recovery of the oil and natural gas that might otherwise be left in place. Much of the produced oil and natural gas is used for enhanced or improved recovery methods to aid in lifting the oil and natural gas, improving recovery. Without incentives to use the produced oil and natural gas, it would be considered a waste stream causing much of the oil and natural gas in place to be left in the reservoir.

State	Alabama
Category	Tax incentive
Citation	Ala. Code § 40-20-2(b) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Exempts from privilege taxes natural gas lawfully injected for the purpose of lifting oil or gas.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
State	California
Category	Tax incentive
Citation	Cal. Pub. Res Code § 3403
Title	<i>Charge for Gas</i>
Discussion	Natural gas used on-site for pressure-maintenance or other producing operations is exempt from assessment.
URL	
State	Florida
Category	Tax incentive
Citation	Fla. Stat. Title XIV, § 211.027 (1)
Title	<i>Exemption for On-site Use of Production</i>
Discussion	Oil and gas produced and used on-site are exempt from severance taxes.

On-site Use of Produced Oil/Gas

URL	
State	North Dakota
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-02-16
Title	<i>Exemption for Lease Use Gas</i>
Discussion	Services (No Trigger). Natural gas used on-site in the production of oil or gas is exempt from production taxes.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-02.pdf
State	North Dakota
Category	Tax incentive
Citation	N.D. Cent. Code § 38-08-06.4
Title	<i>Commission Shall Determine Market Demand and Regulate the Amount of Production</i>
Discussion	Stranded Gas Usage. Gas burned at the well site to power an electrical generator that consumes at least 75% of the gas from the well is exempt from the gross production tax.
URL	http://www.legis.nd.gov/cencode/t38c08.pdf

Orphaned and Abandoned Wells

Orphaned and Abandoned Wells

A well that is not producing or injecting, has not received state approval to remain idle, and for which the operator is unknown or insolvent (IOGCC)

State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil and Gas Commission General Rules and Regulations § G-1, G-2, G3
Title	<i>Abandoned, Orphan or Leaking Wells</i>
Discussion	The amendment defines abandoned wells as those not having produced for 2 years, those without payment of annual well fees, wells not plugged in accordance with order, etc. The director may bring application to the Commission to request abandonment determination. The operator must repay any funds expended by the Commission Well site equipment, including any hydrocarbons, may be disposed to offset plugging costs. The bill also provides administrative procedures to request transfer of abandoned or orphaned wells to another operator, as opposed to AOGC plugging; to acquire a signed, properly recorded lease; and to pay salvage value for any equipment at the well. The director has discretion to approve or deny any transfer requests. Decisions may be appealed to the Commission (\$250 fee – A-3).prior to issuance of any further drilling permits, and additional bonding may be required. The bill defines orphaned wellsas those where the permit holder can't be located; those where the well isn't covered by a bond from the last operator; and those where annual well fees have never been paid. If a well satisfies the criteria, the director administratively determines the well to be orphaned, which authorizes expenditures of funds to plug the well.
URL	
State	California
Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3204
Title	<i>Individual Bond</i>
Discussion	See Cal. Pub. Res Code § 3206
URL	
State	California

Orphaned and Abandoned Wells

Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3205
Title	<i>Blanket Bond</i>
Discussion	See Cal. Pub. Res Code § 3206
URL	
State	California
Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3205.5
Title	<i>Cash Bonds</i>
Discussion	See Cal. Pub. Res Code § 3206
URL	
State	California
Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3206
Title	<i>Long-term Idle Well Bonds/Fees</i>
Discussion	In response to the growing number of idle and orphaned wells, bonding levels for active and long-term idle wells and idle well fees were increased to provide more financial assurance and more funding to plug existing orphaned wells.
URL	
State	California
Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3238
Title	<i>Charges for Certain Wells</i>
Discussion	California provides a 10-year abeyance of the assessment on oil and gas produced from orphaned wells and wells that have been idle for five or more years when they are returned to productive status. Furthermore, the State Oil and Gas Supervisor may permit an operator to evaluate the economic viability of an orphaned well for 90 days without

Orphaned and Abandoned Wells

	having to provide bond coverage or assume plugging responsibility for the "adopted" orphaned well.
URL	
State	California
Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3258
Title	<i>Division Expenditures</i>
Discussion	The orphaned well plugging fund is doubled from \$1 million annually to \$2 million annually for a period of four years.
URL	
State	Illinois
Category	Tax incentive
Citation	Illinois Public Act 094-1085
Title	<i>Crude Oil Marketing and Education Act</i>
Discussion	This voluntary program is modeled after the Oklahoma Energy Resources Board. A tax of 1/10th of 1% of gross revenue of crude oil sales is collected into a fund. One-half of the fund is dedicated to abandoned oilfield site cleanup and the other half funds energy education in public schools.
URL	http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1392&ChapAct=225 ILCS 728/&ChapterID=24&ChapterName=PROFESSIONS AND OCCUPATIONS&ActName=Illinois Petroleum
State	Louisiana
Category	Laws and Regulation
Citation	La. Rev. Stat. Ann. § 30:80
Title	<i>Louisiana Oilfield Site Restoration Law</i>
Discussion	Act 404 of the 1993 Regular Session established the Oilfield Site Restoration (OSR) Law that includes an orphaned well plugging and site restoration fund. Fund oversight is provided by

Orphaned and Abandoned Wells

	an OSR Commission. Revenue for the fund is generated from a fee on oil and gas production in the state, which is paid quarterly by Louisiana oil and gas operators. The imposed fee on production is in the amount of \$.015 per barrel of oil and condensate and \$.003 per Mcf of gas. Additionally, in accordance with the provisions of the OSR Law, when a transfer of ownership interest of an oilfield site occurs, either party of the transfer can elect to file an application to establish a site-specific trust account (SSTA) to cover future restoration costs. Doing this relieves the fee-generated portion of the fund from the financial burden of paying for restoration at the site covered by the SSTA in the event the site is orphaned. SSTA funds are not for general program use and are earmarked specifically to be used to restore the site to which they are dedicated. Once established, site-specific trust accounts remain with the site through subsequent property transfers.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=87691
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann. § 1509.071
Title	<i>Forfeiture of bond; oil and gas well fund; proceedings for forfeiture of appurtenant equipment to state; landowner may apply to plug well; transfer of ownership</i>
Discussion	A landowner grant program has been established for the plugging of orphaned wells. Between \$300,000 and \$500,000 per year will be set aside to fund this program. Eligible landowners can plug the orphaned wells on their land sooner and have more control in the plugging process than in the state's traditional bid process. The landowners must receive bids from contractors for a plugging plan that complies with state regulations and must submit an application to the Division of Mineral Resources Management. If approved, the landowner will be reimbursed for the cost of plugging.
URL	http://codes.ohio.gov/orc/1509.071
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann. § 1509.071
Title	<i>Forfeiting Bond</i>
Discussion	This law permits the Division of Mineral Resources Management to transfer to landowners or their agents for production, a well eligible for plugging under this program if Ohio's well ownership requirements are met. Wells previously abandoned will become property of the state. Landowners or registered well owners can take over the well for production.

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URL	http://codes.ohio.gov/orc/1509.071
State	Oklahoma
Category	Resource
Citation	
Title	<i>Brownfields Restoration Program</i>
Discussion	The Oklahoma Corporation Commission has a Brownfields program to help people and companies deal with these old, potentially polluted sites. The state provides information and guidance, some free services, and helps them access various programs. At the end of the process, the new owner/operator can be granted a state and federal liability release. The program can: (1) Determine eligibility; (2) Conduct some limited assessment work at a potentially polluted oil/gas site, at no cost to the eligible owner/operator, to determine if the property is likely polluted or not; (3) Provide complete no-cost assessments and sometimes a portion of the cleanup costs if a government, church, or non-profit is seeking to buy or use the property; (4) Refer an abandoned polluted and/or junk-filled oilfield site to the OERB for a fully funded (no cost) cleanup; (5) Help owners/operators access the state plugging fund for abandoned oil and gas wells found on the property, at no cost; (6) Help prospective purchasers access the Commission's Petroleum Storage Tank Indemnity Fund, which after a small deductible (often waived for cities and non-profits) will pay to assess and clean up the property at no additional cost; (7) Refer owners to the Commission group that can investigate the source of unknown gas fumes in buildings, and help with curing the problem; and (8) Keep eligible site owners/operators informed about periodic federal Brownfields grants, up to \$200,000 per site to pay for additional assessment work and to clean up the property, that can be applied for. Sites that go through the Brownfields program have a State and Federal liability release.
URL	
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. tit. 68, § 1001(F)
Title	<i>Property Exempt from Taxation</i>
Discussion	The statute exempts wells on which work to re-establish production commenced on or after July 1, 1994, and on or before June 30, 1997, that have not produced oil, natural gas, or oil and natural gas for a period of not less than two years, as evidenced by the appropriate forms on file with the Oklahoma Corporation Commission reflecting the well's status. Also exempt are wells on which work to re-establish production commenced on or after July 1, 1997, and on or before June 30, 2009, that have not produced oil, natural gas,

Orphaned and Abandoned Wells

	or oil and natural gas for a period of not less than one year, as evidenced by the appropriate forms on file with the Oklahoma Corporation Commission reflecting the well's status. Exemption is also granted to any well which, after July 1, 1997, experiences mechanical failure or loss of mechanical integrity, as defined by the Corporation Commission, including but not limited to, casing leaks, collapse of casing, loss of equipment in a wellbore or any similar event which causes cessation of production and results in a workover of the well, as evidenced by the use of a workover rig or other mechanical device being placed over the well to repair the well or equipment. Qualified wells are exempt for a period of 28 months from the date production was re-established. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf#http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Pennsylvania
Category	
Citation	71 Pa. Stat. Ann. § 1934-A
Title	
Discussion	Grandfathering Pre-Act Wells from Bonding. Bonding is not required for any well drilled prior to April 18, 1985, the date of the Oil and Gas Act, or for on-site disposal of residual waste at these well sites.
URL	
State	Pennsylvania
Category	Laws and Regulation
Citation	Pa. Laws 223, Chapter 6, § 601(c)
Title	<i>Well Plugging Funds</i>
Discussion	Orphan Wells. Permit fees are waived for producers who recondition an orphaned well from the Department of Environmental Protection's plugging inventory and return it to production.
URL	http://www.dep.state.pa.us/dep/deputate/minres/oilgas/act223ch4_6.htm#Sec_601
State	Texas
Category	Laws and Regulation
Citation	HB 2161

Orphaned and Abandoned Wells

Title	<i>AN ACT relating to the power of the Railroad Commission of Texas to adopt and enforce safety standards and practices applicable to the transportation by pipeline of certain substances and to certain pipeline facilities, the provision of severance tax credits and exemptions and other incentives and procedures for producing oil or gas from certain wells or plugging wells, and the procedure for computing severance taxes in connection with certain gas sales; imposing an administrative penalty.</i>
Discussion	See Texas Natural Resources Code § 89.047; adopted by 79th Legislature
URL	http://www.capitol.state.tx.us/tlodocs/79R/billtext/pdf/HB02161F.pdf
State	Texas
Category	Laws and Regulation
Citation	Tex. Nat. Res. Code Ann. § 89.047
Title	<i>Orphaned Well Reduction Program</i>
Discussion	An orphaned well under this program is defined as a well that has been inactive for 12 months where the operator of the well no longer has a current registration with the Railroad Commission as required by Texas statute. Under the program, a prospective new operator may nominate the well and be given a 30-day period during which he can (through visual means and non-invasive testing methods) inspect the well to determine whether the person wishes to assume operatorship of the well. If so, the operator provides evidence of a good-faith claim to the right to produce minerals from the well, files paperwork with the Commission to assume operatorship of the well, and remits a \$250 fee. If an orphaned well is taken over by a new operator under this program during the effective period (i.e., January 1, 2006, to December 31, 2007), the operator is entitled to receive: (1) a non-transferable exemption from severance taxes for all future production from a well under Tax Code §202.060; (2) a non-transferable exemption from the fees provided by Natural Resources Code §§81.116 and 81.117 (oil and gas regulatory fees paid into the Oilfield Cleanup Fund based on production) for all future production from the well; and (3) a payment from the Commission in an amount equal to the depth of the well times \$0.50/foot if, not later than the third anniversary of the date the operator acquires the well, the operator brings the well back into continuous active operation or plugs the well in accordance with Commission rules. (Note that payments under this program are made in the order that operators qualify for them. The Commission is limited to total payments of \$500,000 under this program per fiscal year. Operators may not receive more than one payment for a particular well, nor may they receive aggregate payments in excess of the amount of financial security posted under Natural Resources Code §91.104.)
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.89.htm#89.047
State	Texas

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Category	Tax Incentive
Citation	Tex. Nat. Res. Code Ann. § 89.047
Title	<i>Exemption for Gas from Reactivated Orphaned Wells</i>
Discussion	An exemption for gas and casinghead gas from a well certified as an "orphan well" by the Texas Railroad Commission. An orphan well is defined in Section 89.047(a)(3) of the Natural Resources Code as one that has a commission permit, has not reported production for the preceding 12 months, and whose current operator's commission-approved organization report has lapsed. When a certified orphan well is put back into production by a certified orphan well operator, the well will be eligible for a 100 percent exemption from natural gas production tax and the oilfield cleanup fee for as long the certified operator operates the well. Effective January 1, 2006.
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.89.htm#89.047
State	Texas
Category	Tax Incentive
Citation	Tex. Tax Code Ann. § 202.060
Title	<i>Exemption for Oil or Gas from Reactivated Orphan Wells</i>
Discussion	See Texas Natural Resources Code §89.047
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.060
State	West Virginia
Category	Laws and Regulation
Citation	WV Code Chapter 22, Article 6-19
Title	<i>Bona Fide Future Use Program</i>
Discussion	Effective July 1, 1993, wells that have not been producing in the previous 12 months can be designated as having a "bona fide future use." Such a designation would keep idled wells from being deemed abandoned and avoid subjecting them to a plugging obligation. The goal is to return idled wells to production and encourage new wells.
URL	http://www.legis.state.wv.us/WVCODE/Code.cfm?chap=22&art=6#06

Public Lands Production

Public Lands Production

"Land owned by the state or federal government." (Williams & Meyers)

State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 5-7-41
Title	<i>Assignment of certain state-owned minerals to oil and gas royalty increment status-- Required findings.</i>
Discussion	Oil and Gas Royalty Increment Status. The Commissioner of School and Public Lands can grant significantly lower state royalty rates on school and public lands, when no lease has been issued within the last 10 years, and no prospecting or exploration permit for oil and gas has been issued in the last five years. There cannot have been oil or gas production on the state-owned land or land within the immediate area. The rate may be lowered to 1/16 for the first three years of the lease, 1/12 for the second three years, and a minimum of 1/8 thereafter.
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=5-7-41
State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 5-7-42
Title	<i>See S.D. Codified Laws Ann. § 5-7-41</i>
Discussion	Amount of royalty for leases of lands assigned oil and gas royalty increment status.
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=5-7-42
State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 5-7-43
Title	<i>See S.D. Codified Laws Ann. § 5-7-41</i>
Discussion	Royalty increments for commingled lands assigned oil and gas royalty increment status.
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=5-7-43

Public Lands Production

State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 5-7-44
Title	<i>See S.D. Codified Laws Ann. § 5-7-41</i>
Discussion	Leases offered only during term of royalty increment status.
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=5-7-44
State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 5-7-45
Title	<i>See S.D. Codified Laws Ann. § 5-7-41</i>
Discussion	Commissioner authorized to issue leases for prospecting, exploration and mining.
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=5-7-45
State	Texas
Category	Tax Incentive
Citation	Tex. Admin. Code Title 31 § 1.97
Title	<i>Non-Use</i>
Discussion	See Tex. Nat. Res. Code Ann. § 32.067
URL	http://info.sos.state.tx.us/pls/pub/readtac\$ext.TacPage?sl=R&app=2&p_dir=&p_rloc=95104&p_tloc=&p_ploc=&pg=1&p_tac=95104&ti=31&pt=1&ch=1&rl=97&dt=&z_chk=&z_contains=
State	Texas
Category	Tax incentive
Citation	Tex. Nat. Res. Code Ann. § 32.067
Title	<i>Marginal Property Royalty Rates</i>
Discussion	The Texas School Land Board may grant a reduced royalty rate for a period of two years for marginally economic state leases. To qualify, the lease must produce an average of

Public Lands Production

	15 BOPD per well, or an average of 90 Mcf of gas per day per well. Once the reduced rate is granted, royalty rates will not increase for that lease for two years. Additional reductions can be applied for at the expiration of the two-year period. This tax reduction applies when oil prices average less than \$25 per barrel.
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.32.htm#32.067
State	Texas
Category	Tax Incentive
Citation	Tex. Nat. Res. Code Ann. § 52.011
Title	<i>Lease of Public School and Gulf Land</i>
Discussion	"Royalty rates are reduced for production early in the terms of leases. For submerged areas, production in years one and two earns a royalty of 20%; production in years three and four earns 22%. For uplands production, year one earns a royalty rate of 20%; production in year two earns 22.5%. Goal: Maintain overall royalty revenue while providing an operator greater working interest revenue. Impact: The effectiveness of this incentive has not been studied, but it is reported that more activity occurs earlier in the terms of leases since the rule took effect than prior to implementation of the incentive. The program benefits both the state and operators. Active Supporters: TIPRO, Texas Mid-Continent Oil and Gas Association, and Industry "
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.52.htm#52.011

Regulatory Streamlining

Regulatory Streamlining

A thoughtful process of making regulations and compliance simpler, saving money for both government and the regulated community, all without decreasing regulatory effectiveness. Streamlining is a constant process that evolves with technology, modernized business practices, government capacity and emerging regulatory needs. (IOGCC)

State	Alabama
Category	Laws and Regulation
Citation	Ala. Code § 9-17-33
Title	<i>Disposition of proceeds derived from sale of oil or gas product</i>
Discussion	Increases the minimum royalty payment threshold to \$100
URL	
State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § A-8
Title	<i>Reporting Requirements for Mineral Proceeds Escrow Accounts</i>
Discussion	The new rule establishes specific requirements for reporting of funds held for the benefit of unknown or unlocatable mineral owners. The requirements: *Must hold funds in an account with a bank licensed to do business in Arkansas. *Must file an annual report detailing the following: name and address of owner; legal description of property interest; location of number of account; persons authorized to withdraw from account; and whatever information the AOGC may require. The report is to be filed by February 1 every year, and there will be a civil penalty of up to \$1,000 for each violation.
URL	
State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § B-11
Title	<i>Natural Gas or Fresh Water Supply Wells for Domestic Use</i>

Regulatory Streamlining

Discussion	This new rule provides methodology for the transfer of natural gas production wells to landowners for domestic use purposes. Production may be used only on property where the well is located. Written agreement from all owners must be filed. the rule provides methodology for the transfer of natural gas or oil production wells to landowners for use as domestic water supply wells.
URL	
State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § B-40
Title	<i>Administrative Approval of Exceptional Locations</i>
Discussion	The amendment allows administrative approval for wells that have been drilled, but prior to commencement of production. If administrative application is denied, the applicant may request a hearing in accordance with A-2 and A-3, except that no additional fee is required. It authorizes administrative approval for sharing an exceptionally located well between two or more integrated drilling units, which are held by production, based upon any “calculated area” (shape) that all working interest owners in all units agree upon. The director has discretion to refer the application to the Commission for a hearing.
URL	
State	Arkansas
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § D-17
Title	<i>Regulation of Natural Gas Pipelines</i>
Discussion	This amendment clarifies that Arkansas Oil and Gas Commission (AOGC) jurisdiction includes all types of pipelines upstream of custody transfer, not just type gathering lines. It exempts pipeline systems less than 1 mile in length, and which do not cross public roads, railroads, or perennial streams from paying the permit fee. It also establishes requirements for lines not subject to federal regulation; clarifies incorporation of federal construction, operation, and maintenance requirements into state regulation; And specifies additional requirements for pipelines containing Hydrogen Sulfide.
URL	
State	Arkansas
Category	Laws and Regulation

Regulatory Streamlining

Citation	Arkansas Oil & Gas Commission General Rules and Regulations § E-3
Title	<i>Exploration and Production Fluid Handling and Transportation</i>
Discussion	The new rule requires each “transporter” using motor vehicles to transport exploration and production fluid (excludes fresh water) to be permitted. Each transporter is required to submit a Form 1 Organization Report, and a Form 32, along with applicable application fee (\$100 per tank). A permit sticker is to be placed at the rear of each transportation tank. Each transporter shall be in compliance with this rule by March 30, 2009. Manifests must be maintained to show produced fluids received, transporter, delivery, and disposal.
URL	
State	California
Category	Laws and Regulation
Citation	AB 1234
Title	<i>Transfer of Pipeline Right of Way</i>
Discussion	This law allows a utility to transfer easements and right of ways associated with a section of gathering pipeline to an individual producer or a cooperative of producers.
URL	
State	California
Category	Laws and Regulation
Citation	AB 1960
Title	<i>Article 4.4 Regulation of Production Facilities</i>
Discussion	New legislation was passed giving the California Division of Oil, Gas, and Geothermal Resources (DOGGR) specific authority to regulate oilfield production facilities. DOGGR did not have this specific authority until now.
URL	
State	Colorado
Category	Laws and Regulation
Citation	
Title	<i>New Rule Development</i>

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Discussion	Colorado promulgated new rules and procedures effective May 1, 2009, to address increases in oil and gas activity in the state. In 2007, upon the urging and initiative of the Colorado Department of Natural Resources, the General Assembly passed legislation to increase the Commission's regulatory authority and oversight obligations to better address the potential adverse impacts that can accompany oil and gas development. The General Assembly declared that it is in the public's interest to foster the responsible, balanced development of Colorado's oil and gas resources consistent with the protection of public health, safety, and welfare, including protection of the environment and wildlife resources. C.R.S. § 34-60-102(1). (cogcc.state.co.us). Read the IOGCC case study later in this chapter
URL	
State	Kansas
Category	Laws and Regulation
Citation	Kan. Stat. Ann. § 55-1624
Title	<i>FERC-Ordered Refunds of Tax Reimbursements; Recovery</i>
Discussion	Royalty Interests, Statute of Limitations on FERC-Ordered Refunds. The period of time during which first sellers of natural gas could commence a civil action against royalty interest owners to obtain refunds of reimbursements for ad valorem taxes on royalty interests during the years 1983 through 1988 was declared expired and the refund claims were deemed to be uncollectible. The legislature reaffirmed that the Kansas five-year statute of limitations found in K.S.A. 60-511 applied to these claims created when the Federal Energy Regulatory Commission (FERC), more than 15 years after its initial determination, reversed its long-standing policy that the Kansas ad valorem tax, which was based on production, was a severance tax and could be added to the maximum lawful price set by the NGPA at that time. FERC ordered first sellers to refund the amount of the ad valorem tax. This statute and that part of the FERC order relating to penalty and interest is under court challenge in both state and federal courts.
URL	
State	Louisiana
Category	Laws and Regulation
Citation	
Title	<i>New Safety Rules Issued</i>
Discussion	In a January 12, 2009, press release, Louisiana Commissioner of Conservation James H. Welsh issued two new permanent rules and a new policy that combine to give Louisiana some of the

Regulatory Streamlining

	most stringent oil and gas drilling safety rules in the country. The new permanent rules, which were effective as of Dec. 20, 2008, track the federal government's requirements on the drilling it regulates, and, as of January 12, a new office policy bans wells within 1,000 feet of the crossing of Interstate highways over major waterways. The 1,000-foot ban includes such areas as the I-10 crossing of the Sabine River, Calcasieu River, Atchafalaya Basin, Mississippi River, Lake Pontchartrain and Pearl River; the I-12 crossing of the Amite River; and the I-20 crossing of the Red, Ouachita, Tensas and Mississippi rivers, among others. Most oil and gas producing states have no rules addressing distance between oil and gas drilling operations and roadways, and the few that do require no more than a 100-foot distance. One of the rules places many new requirements on well operators to ensure the proper design, testing, and use of blowout preventers and diverters, as well as new requirements for the quick operation of valves controlling in-pipe gas and fluid flow. The rule also requires operators to ensure that employees of contracted drilling companies receive recurring training on well control practices and establish procedures to ensure employees retain the knowledge, skill, and competency to perform their well control duties. These safety rules were developed after extensive study by the Louisiana Department of Natural Resources' Office of Conservation and the Commissioner's Ad Hoc Committee on Drilling Safety. The committee included representatives from the state, the oil and gas industry, and landowner interests. http://dnr.louisiana.gov/cons/memos/memo20090112-well-location-policy-interstates.pdf
URL	http://dnr.louisiana.gov/cons/rules200812.pdf
State	Louisiana
Category	Laws and Regulation
Citation	Louisiana HB 159 - 2009 Regular Session (Act 126)
Title	<i>An act to amend and reenact R.S. 30:28(B), relative to drilling permits; to provide for the validity of drilling permits; and to provide for related matters.</i>
Discussion	Effective August 15, 2009, under Act 126 of the 2009 Regular Session, an operator can acquire a permit to drill with a one-year term (period of validity) as opposed to the traditional 180-day term. Both terms, the traditional 180-day permit and the one-year permit will be valid options. The associated fees for each category of the traditional 180-day permit will double for the one-year permit option.
URL	
State	Nevada
Category	Laws and Regulation

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Citation	Nev. Admin.Code § 522.040
Title	<i>Permits to Drill Wells Required; Fees</i>
Discussion	See Nev. Admin.Code § 522.150
URL	http://www.leg.state.nv.us/NRS/NRS-522.html#http://www.leg.state.nv.us/NRS/NRS-522.html#NRS522Sec040
State	Nevada
Category	Laws and Regulation
Citation	Nev. Admin.Code § 522.050
Title	<i>Payment of Expenses for IOGCC; Administrative Fee</i>
Discussion	See Nev. Admin.Code § 522.150
URL	http://www.leg.state.nv.us/NRS/NRS-522.html#NRS522Sec050
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann § 1509.03
Title	<i>Administrative Rules</i>
Discussion	See Ohio Rev. Code Ann. §1509.02
URL	http://codes.ohio.gov/orc/1509.02#http://codes.ohio.gov/orc/1509.03
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann § 1509.06
Title	<i>Application for Permit to Drill, Reopen, Convert, or Plug Back a Well</i>
Discussion	See Ohio Rev. Code Ann. §1509.02
URL	http://codes.ohio.gov/orc/1509.03
State	Ohio

Regulatory Streamlining

Category	Laws and Regulation
Citation	Ohio Rev. Code Ann § 1509.23
Title	<i>Health and Safety Rules for Drilling of Wells and Production of Oil and Gas</i>
Discussion	See Ohio Rev. Code Ann. §1509.02
URL	http://codes.ohio.gov/orc/1509.23
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann § 1509.31
Title	<i>Notice to Holder of Royalty Interest of Assignment or Transfer of Entire Interest in Lease</i>
Discussion	See Ohio Rev. Code Ann. §1509.02
URL	http://codes.ohio.gov/orc/1509.31
State	Ohio
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann. § 1509.02
Title	<i>Division of mineral resources management</i>
Discussion	Division of Mineral Resources Management. Under House bills 278 and 279, Ohio Revised Code Sections 1509.02, 1509.03, 1509.06, 1509.23 and 1509.31 were amended and 1509.39 was repealed. The amendments and repeal provided for the Division of Mineral Resources Management to be the sole and exclusive authority to regulate the permitting, location, and spacing of oil and gas wells in Ohio. The House bills created the Oil and Gas Advisory Council, which advised the chief on rules drafted pursuant to the enactment of the bills. Public hearings were held on the draft rules in June and July of 2005 with the effective date of the rules in August 2005. The rules provide more authority for the chief in the areas of safety during the drilling and production of oil and gas wells, protection of groundwater resources and environmental protection for wells drilled in “urbanized areas” (all municipal corporations and any township with an unincorporated population exceeding 5,000).
URL	http://codes.ohio.gov/orc/1509.02
State	Oregon
Category	Tax Incentive

Regulatory Streamlining

Citation	Or. Rev. Stat. § 324.090(1)
Title	<i>14.002 State and Local Interests</i>
Discussion	Any royalty or other interest in oil or gas owned by the state or local government is exempt from the oil and gas severance tax.
URL	
State	Oregon
Category	Tax Incentive
Citation	Or. Rev. Stat. § 324.090(2)
Title	<i>14.003 Credit for Property Taxes Paid</i>
Discussion	A credit is allowed against the oil and gas severance tax for all property taxes imposed. This includes taxes on any property rights attached to the right to produce oil and gas, producing oil and gas leases, and machinery and equipment used in the operation of the well.
URL	
State	Pennsylvania
Category	Tax incentive
Citation	73 P.S. § 2260.101 et. Seq.
Title	<i>Regulatory Electronic Transactions</i>
Discussion	Electronic Transactions Act. In December of 1999 the Pennsylvania Legislature passed this version of the Uniform Electronic Transactions Act. This legislation can be considered an incentive in that it allows for the electronic submission of permit applications and required reports.
URL	
State	South Dakota
Category	Laws and Regulation
Citation	S.D. Codified Laws § 45-9-40
Title	<i>Order of board for unit operation of a pool the percentage of owners required to ratify an oil and gas unit</i>

Regulatory Streamlining

Discussion	To encourage more exploration and increase production of oil and gas resources in South Dakota while protecting all owners' rights and preventing the drilling of unnecessary wells, the South Dakota Legislature approved, and Governor Rounds signed HB1014. The statute, 45-9-40, took effect July 1, 2004.
URL	http://legis.state.sd.us/sessions/2004/bills/HB1014enr.pdf
State	Texas
Category	Laws and Regulation
Citation	
Title	<i>Severance Tax Administration</i>
Discussion	Removal of accelerated biennial due date ("speed up") for natural gas severance taxes and penalties for speeding up late payments. Eliminates early payment of natural gas tax in odd-numbered years. Agency: Comptroller of Public Accounts.
URL	
State	Texas
Category	Tax incentive
Citation	Tex. Nat. Res. Code Ann. § 91.402(d)
Title	<i>Time for Payment of Proceeds</i>
Discussion	Producers may delay payment of royalties until they reach a total of \$100 or 12 months proceeds have accumulated, whichever comes first. Annual reporting for the lease may not exceed \$3,000. This corresponds to HB 1593.
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.91.htm#91.402

Returning Idle Wells to Production

Returning Idle Wells to Production

State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1002
Title	<i>Tax Incentives — Reestablishment of Inactive Wells and Fields</i>
Discussion	An inactive oilfield that is later returned to production shall be exempted from severance taxes for oil produced from all zones, horizons, and formations that were once productive but have ceased to produce.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1002.htm
State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1002
Title	<i>Tax Incentives — Reestablishment of Inactive Wells and Fields</i>
Discussion	Idle and inactive oil wells (no production for 12 consecutive months) that are restored and re-established as producing wells are exempted from severance taxes for 10 years from the date of renewed production.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1002.htm#http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1002.htm
State	Kentucky
Category	Tax incentive
Citation	Ky. Rev. Stat. Ann. § 137.132
Title	<i>Credit for Production from Recovered Inactive Petroleum Wells</i>
Discussion	The statute gives producers a credit on the 4.5% severance tax imposed on production from oil wells that are brought back into production after having been inactive for two years, or plugged and abandoned.
URL	http://lrc.ky.gov/KRS/137-00/132.PDF
State	Kentucky

Returning Idle Wells to Production

Category	Tax incentive
Citation	Ky. Rev. Stat. Ann. § 143A.033
Title	<i>Credit for Production from Recovered Inactive Natural Gas Wells</i>
Discussion	The statute gives producers a credit on the 4.5% severance tax imposed on production from natural gas wells that are brought back into production after having been inactive for two years, or plugged and abandoned.
URL	http://lrc.ky.gov/KRS/143A00/033.PDF
State	Kentucky
Category	Laws and Regulation
Citation	Ky. Rev. Stat. Ann. § 353.730
Title	<i>Investigation of Abandoned Wells -- Application -- Report -- Bond</i>
Discussion	This statute allows producers with a proper testing permit to test inactive wells for 60 days prior to posting bond for the well.
URL	http://lrc.ky.gov/KRS/353-00/730.PDF
State	New Mexico
Category	Tax incentive
Citation	7-29B-1 NMSA 1978
Title	<i>Natural Gas and Crude Oil Production Incentive Act</i>
Discussion	Production Restoration Project. The Act exempts from severance tax (3.75%) wells that had fewer than 31 days of production in any period of 24 consecutive months after Jan. 1, 1993 that are brought back into production. The Act does not apply when the oil price is \$24 or more per barrel.
URL	
State	North Dakota
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-11
Title	<i>Two-year Inactive Well Exemption</i>

Returning Idle Wells to Production

Discussion	Idle Wells. Production from oil wells that have been inactive for at least two years and are returned to production is exempt from extraction taxes for 10 years, beginning the first day of the month in which NDIC certification is received by the Tax Commissioner. Affected by price trigger.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
State	Texas
Category	Tax incentive
Citation	Tex. Tax code Ann. § 202.056
Title	<i>Exemption for Oil and Gas Wells Previously Inactive</i>
Discussion	The Two-Year Inactive Well Incentive program, extended by the Legislature in September 1999, remains a valuable opportunity for operators of inactive wells to return the wells to production with a 10-year severance tax exemption on crude oil, casinghead gas, and gas well gas produced by the reactivated wells. The filing deadline for this severance tax incentive program was extended to August 31, 2009. The Railroad Commission can certify wells for the program through February 28, 2010. Any gas well or oil well with no more than one month of production in the two-year period prior to application to the Commission for certification can be eligible. The Commission designates monthly all oil and gas wells that meet the above criteria. Operators of these wells will be notified by letter of their initial eligibility for the exemption. Eligible wells are also identified on the Oil and Gas Schedule listed by operator with a single asterisk. As of November 13, 2000, more 95,000 wells have been designated. If a designated well was returned to production prior to August 31, 2009, and the operator files a W-10/G-10 retest or a W-2 retest, the Commission will send a letter to the operator. By signing the bottom of that letter and returning it to the Commission, an operator is applying for certification in the program. Upon approval, a certification letter will be issued to the operator. This certification, along with Comptroller Form AP-158, is then filed with the Comptroller of Public Accounts to receive the tax exemption. Certified wells are identified on the schedule with double asterisks. As of November 13, 2000, more than 4,000 wells had been certified in the program. If necessary, an operator can request a one-time listing of designated and certified wells for his company.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.056
State	Wyoming
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205

Returning Idle Wells to Production

Title	<i>Exemptions</i>
Discussion	Idle wells. Crude oil produced from a previously shut-in well is exempt from severance taxes for the first 60 months of renewed production.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2

Services

Services

State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-3606 (kk)(1)(c)
Title	<i>Kansas Retailers' Sales Tax</i>
Discussion	Electricity and other utilities used in the severance of oil and gas are exempt from the state sales tax.
URL	
State	Montana
Category	Tax incentive
Citation	Mont. Code Ann. § 15-36-305 (1995
Title	<i>Determination of Gross Value of Product</i>
Discussion	Crude oil or gas used by operators in connection with operations is tax exempt.
URL	http://data.opi.mt.gov/bills/mca/15/36/15-36-305.htm
State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 10-45-5.3
Title	<i>Tax on Oil and Gas Field Services</i>
Discussion	Oilfield Services. An oilfield services sales tax provision provides a 1% tax exemption on oilfield services. The effective tax rate is 3%.
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=10-45-5.3
State	Virginia
Category	Tax incentive
Citation	Va. Code Ann. § 58.1-609.3 (12)

Services

Title	<i>Commercial and Industrial Use Exemptions</i>
Discussion	Raw materials, fuel, power, energy, supplies, machinery, tools and repair/replacement parts used directly in the drilling, extraction, refining, or processing of natural gas or oil and reclamation of the well area are exempt from the 4% state sales and use tax, and the 1% local sales and use tax. Exemption includes all phases of production and processing, including gathering, until gas is pipeline quality.
URL	http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+58.1-609.3

Shale Gas

Shale Gas

State	Alabama
Category	Laws and Regulation
Citation	Ala. Code §§ 9-17-1, 9-17-6, 9-17-12
Title	<i>Drainage or Production Units</i>
Discussion	Allows more than one well to be drilled and produced within the drainage or production units in shale gas fields.
URL	http://www.gsa.state.al.us/ogb/statutes.aspx#http://www.gsa.state.al.us/ogb/statutes.aspx
State	Oklahoma
Category	Laws and Regulation
Citation	Okla. Admin. Code § 165:10-17
Title	<i>Well Tests</i>
Discussion	Upon written request, the rulemaking provided for more time to perform the state test than the 30-day period specified in the rule. This change was implemented primarily to accommodate the longer time required to recover frac fluids and "fines" created in certain stimulation techniques used in the completion of Woodford Shale gas wells. Shutting in the well too early to perform the state test posed a higher risk of damaging the well or even losing it.
URL	
State	South Dakota
Category	Laws and Regulation
Citation	S.D. Admin. R. 74:10:03:16
Title	<i>Procedures for Setting Surface Casing and Production Casing</i>
Discussion	The rule currently requires a minimum of 100 feet of surface casing to protect shallow aquifers in all oil and gas wells. Operators that are exploring for shallow oil and gas in the state asked the department to change the current rule because some of the oil and gas they are targeting is at depths of less than 100 feet. In addition, there are areas in the state where 100 feet of surface casing is not necessary due to the surface geology (shale, glacial till). This rule change will allow the Secretary to waive the minimum 100 feet of surface casing requirement

Shale Gas

	in such cases. The Board of Minerals and Environment held a hearing and approved the change to this rule on July 16, 2008, and the Legislative Interim Rules Committee held a hearing and approved the change to this rule on August 19, 2008.
URL	http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:10:03:16

Temporary Abandonment

Temporary Abandonment

Temporary Abandonment -- "Cessation of work on a well pending determination of whether it should be completed as a producer or permanently abandoned." (Williams & Meyers)

Idle Well --. (1) A well that is not producing or injecting, and has received state approval to remain idle; or (2) a well that is not producing or injecting, has not received state approval to remain idle, and for which the operator is known or solvent. (IOGCC)

State	Kansas
Category	Laws and Regulation
Citation	Kan. Admin. Regs. § 82-3-111
Title	<i>Temporarily Abandoned Wells; Penalty; Plugging.</i>
Discussion	This regulation allows operators more than 90 days of non-production before having to file a temporary abandonment (TA) application. It also provides a framework for non-producing wells that may be fully equipped and capable of production relief from filing for TA approval up to 364 days of non-production and extends the 90-day time requirement for plugging or returning a well back into service. This is to allow operators more time to re-work and re-establish production for wells that may be non-producing for more than 90 days due to low product price or inability to obtain service equipment (pulling units, parts, etc.), without the formal filing of a TA application.
URL	http://www.kcc.state.ks.us/conservation/cons_rr_0704.pdf
State	Kansas
Category	Laws and Regulation
Citation	Kan. Admin. Regs. § 82-3-111 (b)
Title	<i>Temporarily Abandoned Wells; Penalty; Plugging</i>
Discussion	Regulations for temporarily abandoned wells have been modified, placing a cap of 10 years on temporarily abandoned wells.
URL	http://www.kcc.state.ks.us/conservation/cons_rr_0704.pdf
State	Michigan
Category	Laws and Regulation
Citation	Supervisor of Wells Instruction 1-2004

Temporary Abandonment

Title	<i>Conditions of Approval of Temporarily Abandoned Status for Oil and Gas Wells</i>
Discussion	Michigan Comp. Laws § 324.61501 lays out rules regulating waste of oil and gas in Michigan. Companies may temporarily abandon up to 10% of wells and greater an even greater percentage with supplemental bonding.
URL	http://www.michigan.gov/deq/0,1607,7-135-3311_4111_36974---,00.html
State	North Dakota
Category	Laws and Regulation
Citation	N.D. Admin. Code § 43-02-03-55
Title	<i>Abandonment of Wells -- Suspension of Drilling</i>
Discussion	Temporary Abandonment of Wells, Suspension of Drilling. This rule defines what constitutes abandonment of a well. The rule also dictates how soon after abandonment a well is to be plugged and the drill site reclaimed. By giving the well temporarily abandoned status, the NDIC director may waive this requirement for one year. The director may extend a well's temporarily abandoned status annually. The director also may approve suspension of the drilling of a well. If suspension is approved, a plug must be placed at the top of the casing. Unless authorized by the director, a well must be plugged and its site reclaimed if drilling has been suspended for 30 days. The goal is to prevent the permanent plugging of wells due to low oil prices.
URL	http://www.legis.nd.gov/information/acdata/pdf/43-02-03.pdf
State	West Virginia
Category	Laws and Regulation
Citation	WV Code Chapter 22, Article 6-19
Title	<i>Bona Fide Future Use Program</i>
Discussion	Wells that have not been producing in the previous 12 months can be designated as having a "bona fide future use." Such a designation would keep idled wells from being deemed abandoned and avoid subjecting them to a plugging obligation.
URL	http://www.legis.state.wv.us/WVCODE/Code.cfm?chap=22&art=6#06

Tight Sands

Tight Sands

State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §26-58-111
Title	<i>Rates of Tax</i>
Discussion	Tight sands and unconventional sources receive a severance tax reduction from 5% to 1.5% for 36 to 48 months depending on well payout.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm#http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm

Unitization

Unitization

"A term frequently used interchangeably with pooling but more properly used to denominate the joint operation of all or some portion of a producing reservoir as distinguished from pooling, which term is used to describe the bringing together of small tracts sufficient for the granting of a well permit under applicable spacing rules (Williams, Meyers, Martin, & Kramer, 2006)."

State	Alabama
Category	Tax incentive
Citation	Ala. Code § 40-20-2(e) (1975)
Title	<i>Levy and Amount of Tax upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Computes per well production of oil from unit operations for tax purposes based on aggregate production of oil from the entire unit divided by the number of wells within the unit, including injection, disposal and other wells utilized in unit operations.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
State	Alabama
Category	Tax incentive
Citation	Ala. Code § 9-17-85
Title	<i>Ratification</i>
Discussion	Reduces the percentage from 75% to 66 2/3% for ratification of a unit agreement under the terms of the allocation formula established by the State Oil and Gas Board and for ratification of an addition to the unit area.
URL	http://www.gsa.state.al.us/ogb/statutes.aspx
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 55-1304
Title	<i>Oil and Gas; Unitization</i>
Discussion	This act empowers the Kansas Corporation Commission (KCC) to unitize a pool upon request

Unitization

	of a working interest owner under certain circumstances. First, the primary production from a pool has reached a low economic level and without introduction of artificial energy, abandonment of the well is imminent; or the unitized management sought is economically feasible and necessary to prevent waste. Second, the value of the estimated recovery is greater than the costs incident to conducting the recovery. Finally, the operation is fair and equitable. The act further establishes the rights of owners of oil and gas rights under unleased land as being a working interest to the extent of 7/8 interest and a royalty owner to the extent of 1/8 interest. The KCC can alter the extent of a royalty interest. Finally, the act states that it is the duty of the operator of the unit to file ad valorem taxes.
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 55-1305
Title	<i>Matters to Be Found by the Commission Precedent to Issuance of Unitization Orders; Hearings</i>
Discussion	See Kan. Stat. Ann. § 55-1304
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 55-1308
Title	<i>Commission Orders</i>
Discussion	See Kan. Stat. Ann. § 55-1304
URL	
State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 55-1312
Title	<i>Rendition for Taxation of Property Used by Unit; Assessment and Taxation</i>
Discussion	See Kan. Stat. Ann. § 55-1304
URL	

Unitization

State	Kansas
Category	Tax incentive
Citation	Kan. Stat. Ann. § 55-1316
Title	<i>Oil and Gas; Unitization; Definition of "Pool"; Legislative Intent</i>
Discussion	K.S.A. 55-1316 changed the definition of “pool” as it relates to the underground accumulation of oil and gas. This statute change expanded the definition of a “pool” to include “one or more natural reservoirs that are pressure connected.” This statutory change now allows for unitization in pools that have commingled production from more than one reservoir due to pressure communication within the wellbore. Additionally, K.S.A. 1317 provides that if at least 90% or more of the working interest owners approve, in writing, a contract for the unit operations of a pool or part of a pool, then the unit operations becomes effective without application to or order by the Kansas Corporation Commission. These statutes are part of Article 13 of Chapter 55 of the Kansas Statutes Annotated and amendments thereto. This is to allow the right of unitization of certain commingled pressure communicated reservoir(s) within a common wellbore. It also allows the establishment of voluntary unitization operations when at least 90% of the working interest owners ratify in writing, establishing such unit operations without KCC application or order of approval.
URL	
State	North Dakota
Category	Laws and Regulation
Citation	N.D. Cent. Code § 38-08-09.5
Title	<i>Ratification or Approval of Plan by Lessees and Owners</i>
Discussion	Statutory Unit Ratification. The statute lowers from 70% to 60% the percentage approval of working interests and mineral owners required to form an oil production unit. The NDIC and the NDPC are monitoring the effectiveness of this incentive.
URL	http://www.legis.nd.gov/cencode/t38c08.pd
State	South Dakota
Category	Laws and Regulation
Citation	S.D. Admin. R. 74:10:18
Title	<i>Risk Compensation in Compulsory Pooling and Unitization Orders</i>
Discussion	New rules were approved by the board, reviewed, and approved by the Legislative Research

Unitization

	Council, and took effect July 1, 2004.
URL	http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:10:18
State	South Dakota
Category	Tax incentive
Citation	S.D. Admin. R. 74:10:18
Title	<i>Risk Compensation in Compulsory Pooling and Unitization Orders</i>
Discussion	Risk Compensation. The rule specifies risk compensation allowed in cases of forced pooling and compulsory unitization. It also allows cost plus 200% in compulsory pooling where interest is derived from a lease or other contract and allows cost plus 100% where interest is not subject to a lease or other contract. It allows cost plus 200% in compulsory unitization where interest is derived from a lease or other contract and allows cost plus 100% where interest is not subject to a lease or other contract. This incentive is to be granted by the South Dakota Department of Environment and Natural Resources Oil and Gas Section.
URL	http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:10:18
State	South Dakota
Category	Tax incentive
Citation	S.D. Codified Laws § 45-9-40
Title	<i>Order of Board for Unit Operation of a Pool--Not Effective Until Approved by Persons Responsible for Operating Costs</i>
Discussion	Unit Ratification. This change lowered from 75% to 60% the percentage of working interest and mineral interest owners needed to ratify unit operations in cases of compulsory unitization. This incentive is to be granted by the South Dakota Department of Environment and Natural Resources Oil and Gas Section.
URL	http://legis.state.sd.us/sessions/2004/bills/HB1014enr.pdf

Venting/Flaring of Gas

Venting/Flaring of Gas

Venting or flaring of gas cuts down on the costs associated with production. By allowing the venting or flaring of natural gas, states are helping to keep the costs of production down. While venting or flaring is traditionally considered waste, some states will require that royalties be paid on the vented gas after a specified period of venting or flaring. As mentioned above, the use of produced oil or natural gas also limits venting by encouraging use of oil or gas that would be otherwise wasted in recovery operations. Where recovery operations are not feasible or are cost prohibitive, especially for smaller producers, allowing venting keeps costs down and keeps wells flowing.

State	Kansas
Category	Laws and Regulation
Citation	Kan. Stat. Ann. § 55-102
Title	<i>Permitted</i>
Discussion	Venting and Flaring of Gas. This statute change allows venting or flaring of gas from natural gas wells (including gas from coal seams) when approved by the Kansas Corporation Commission. The venting or flaring of gas always has been associated with waste and, therefore, was not allowed except for associated casing head gas from oil wells.
URL	
State	Michigan
Category	Laws and Regulation
Citation	Special Order No. 3-71, amended
Title	<i>No Flare Order</i>
Discussion	Mich. Comp. Laws § 324.61501 lays out the rules regulating waste of oil and gas in Michigan. Flaring of gas is allowed at specified volumes.
URL	http://www.michigan.gov/documents/deq/ogs-cause-1971-03-SO_266597_7.pdf
State	Michigan
Category	Laws and Regulation
Citation	Supervisor of Wells Order No. 18-2007
Title	

Venting/Flaring of Gas

Discussion	Mich. Comp. Laws § 324.61501 lays out the rules regulating waste of oil and gas in Michigan. Flaring of gas is allowed at specified volumes.
URL	http://www.michigan.gov/documents/deq/ogs-oilandgas-spacing-albionscipio_258038_7.pdf
State	North Dakota
Category	Tax incentive
Citation	N.D. Cent. Code § 38-08-06.4
Title	<i>Flaring of Gas Restricted - Imposition of Tax - Payment of Royalties -Industrial Commission Authority</i>
Discussion	Flared Gas. Gas produced with crude oil from an oil well may be flared during a one-year period from the date of first production from the well without paying royalties and taxes. A producer may obtain an exemption to the one-year period after showing that connection of the well to a natural gas gathering line is economically infeasible or that a market for the gas is not available and that equipping the well with an electrical generator to produce electricity from gas is not economically feasible.
URL	http://www.legis.nd.gov/cencode/t38c08.pdf
State	Texas
Category	Tax Incentive
Citation	HB 2982
Title	<i>AN ACT relating to the transfer of the regulation of injection wells used for in situ uranium mining from the Texas Commission on Environmental Quality to the Railroad Commission of Texas.</i>
Discussion	See Tex. Tax Code Ann. § 202.058
URL	http://www.capitol.state.tx.us/tlodocs/79R/billtext/pdf/HB02982I.pdf
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 201.058
Title	<i>Incentive to Market Previously Flared or Vented Casinghead Gas</i>
Discussion	If an operator markets casinghead gas that had previously been released into the air (vented or flared) for 12 months or more in compliance with Commission rules and regulations, the

Venting/Flaring of Gas

	operator may receive a severance tax exemption on that gas for the life of the well.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.201.htm
State	Texas
Category	Tax Incentive
Citation	Tex. Tax Code Ann. § 201.059
Title	<i>Credits for Qualifying Low-Producing Wells</i>
Discussion	See Tex. Tax Code Ann. § 202.058
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.201.htm#201.059
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 202.058
Title	<i>Credits for Qualifying Low-Producing Oil</i>
Discussion	Flared Casinghead Gas. If an operator markets casinghead gas that previously had been released to the air (vented or flared) for 12 months or more in compliance with RRC rules and regulations, the operator may receive a severance tax exemption for that gas for the life of the oil well or lease.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.201.htm
State	Wyoming
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	Natural gas that is vented, flared or reinjected has no value and is exempt from taxation.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2

Water Management

Water Management

State	Arkansas
Category	Tax incentive
Citation	Ark. Code Ann. §26-58-209
Title	<i>Cost of Maintaining Saltwater Disposal System</i>
Discussion	Severance tax credit for saltwater disposal costs is available for production from wells that produce both oil or gas and saltwater. Costs include depreciation of cash investment, maintaining and improving the system, costs of services, labor, supplies, utilities and other operating expenses.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-209.htm
State	Louisiana
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633
Title	<i>Rates of Tax</i>
Discussion	Produced Water Injection. To help accomplish the objective of reducing the discharge of produced water and to help ease the financial burden placed on the oil and gas industry, it is the purpose of this section to provide an economic incentive to producers of oil and gas by allowing them to realize a severance tax savings (20% on incrementally produced oil and gas) if they inject produced water into an oil or gas reservoir for the purpose of increasing the recovery of hydrocarbons.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1357 (2008)
Title	<i>Exemptions - General</i>
Discussion	Sales Tax Exemption for Electricity and Associated Delivery and Transmission Services Sold for Operating of Reservoir Dewatering Project and/or Unit. The increased use of dewatering methods in certain carbonate and shale reservoirs in Oklahoma, which typically have a high

Water Management

	water cut during the initial phase of hydrocarbon production, stimulated interest in providing a tax incentive to encourage the use of such technology. Reservoir dewatering projects have substantial costs associated with electricity and associated delivery and transmission services caused by the use of high capacity downhole pumps to accelerate the removal of formation water. Likewise, there is added electricity expense caused by operation of large capacity disposal wells configured to receive the high volume of produced water. Once the water is removed at accelerated rates, oil and gas production, which otherwise would be uneconomical under traditional production methods, has often increased substantially. Also, increased development of natural gas from coal seams in eastern Oklahoma, which involves the dewatering of the coal seam to enhance gas production, spurred interest in this incentive. In some areas of the state, electricity sold by public utilities with certified service territories, is subject to state sales tax. To encourage oil and gas development in such areas, the Oklahoma Legislature enacted S.B. 871 (2002) to provide for the Oklahoma Corporation Commission to classify areas and reservoirs as “reservoir dewatering projects” and/or “reservoir watering units,” wherein the statutory criteria of an initial water to oil ratio greater than or equal to five to one (5 to 1) is proved to exist. The regulations implementing S.B. 871 provided for a conversion factor to calculate a water to gas ratio to equate to the 5 to 1 water to oil ratio. Once classified as a “reservoir dewatering project,” request is made to the Oklahoma Tax Commission for a sales tax exemption letter, which the operator uses in its relationship with the electricity supplier to gain an exemption of the state sales tax otherwise charged for sales of electricity and associated delivery and transmission services for operation of the project. The goals of the incentive are (1) to increase the use of reservoir dewatering technology associated with the drilling, exploration, and production of hydrocarbon resources from certain carbonate, shale, and coal seam reservoirs in the state; and (2) to provide a state tax incentive for such drilling, exploration and production enterprises through a reduction of the state’s sales tax burden on the sale of electricity and associated delivery and transmission services, which are an inherently high expense for reservoir dewatering operations.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 151.355
Title	<i>Water Related Incentives</i>
Discussion	Tax Incentive for Reuse/Recycling of Fracturing Water – the incentive provides for an exemption from sales, excise, and use taxes, tangible personal property specifically used to process, reuse, or recycle wastewater that will be used in fracturing work performed at an oil or gas well. Corresponds to House Bill 4.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.151.htm#151.355

Workovers

Workovers

“Operations on a producing well to restore or increase production” (Williams & Meyers). Reworking and modifying equipment, applying improved processes and methodologies provide an opportunity for increased production, increased efficiencies, and reductions in environmental impact.

State	New Mexico
Category	Tax incentive
Citation	7-29B-1 NMSA 1978
Title	<i>Well Workover Project Tax Incentive</i>
Discussion	Well Workover Project. The incentive reduces severance taxes from 3.75% to 2.45% for oil and gas produced from wells having qualified workover operations performed. It does not apply when the price of oil is \$24 or more per barrel.
URL	
State	North Dakota
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-08
Title	<i>Workover Exemption</i>
Discussion	Workover Project Determination. Applicants have the burden of establishing entitlement to the exemption provided in NDCC § 57-51.1-03 and upon completion of the workover project shall submit all information necessary for a determination by the director. Production resulting from qualifying workover projects is exempt from extraction taxes for 12 months, beginning the third month after completion of the workover project, and is taxed at 4% thereafter. Wells that have produced less than 50 BOPD during the last six months of continuous production before workover qualify for this exemption. The operator must notify the NDIC before beginning the project. The project must cost at least \$65,000, or production must increase 50% or more in the first two months after project completion. Affected by price trigger.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
State	Oklahoma
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001(G)

Workovers

Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Production Enhancements – Recompletions. A rebate of the gross production tax may apply to the following: (A) For production enhancement projects having a project beginning date prior to July 1, 1997, any downhole operation in an existing oil well or natural gas well that is conducted to establish production of oil or natural gas from any geological interval not currently completed or producing in such existing oil or natural gas well. (B) For production enhancement projects having a project beginning date on or after July 1, 1997, and prior to July 1, 2009, any downhole operation in an existing oil well or natural gas well that is conducted to establish production of oil or natural gas from any geologic interval not currently completed or producing in such existing oil or natural gas well within the same or a different geologic formation. Production Enhancements – Workovers. A rebate of gross production tax may apply to the following: (A) Any downhole operation in an existing oil or natural gas well that is designed to sustain, restore or increase the production rate or ultimate recovery in a geologic interval currently completed or producing in said existing oil or natural gas well. (B) For production enhancement projects having a project beginning date prior to July 1, 1997, “workover” includes, but is not limited to, acidizing, reperforating, fracture treating, sand/paraffin removal, casing repair, squeeze cementing, setting bridge plugs to isolate water productive zones from oil or natural gas productive zones, or any combination thereof. (C) For production enhancement projects having a project beginning date on or after July 1, 1997, and prior to July 1, 2009, “workover” includes, but is not limited to, acidizing; reperforating; fracture treating; sand, paraffin, or scale removal or other wellbore cleanouts; casing repair; squeeze cementing; installation of compression on a well or group of wells or artificial lifts on oil, natural gas, or oil and natural gas wells, including plunger lifts, rod pumps, submersible pumps and coiled tubing velocity strings; downsizing existing tubing to reduce well loading; downhole commingling; bacteria treatments; upgrading the size of pumping unit equipment; setting bridge plugs to isolate water production zones; or any combination thereof. “Workover” shall not mean the routine maintenance, routine repair, or like-for-like replacement of downhole equipment such as rods, pumps, tubing, packers, or other mechanical devices. Qualified production enhancements shall be exempt for a period of 28 months from the date of first sale after project completion. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
State	Texas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 202.061
Title	<i>Tax Credit for Enhanced Efficiency Equipment</i>
Discussion	The code provides for a severance tax credit for enhanced efficiency equipment installed on marginal oil wells between September 1, 2005, and September 1, 2009. "Enhanced efficiency

Workovers

	equipment" means equipment used in the production of oil that reduces the energy used to produce a barrel of fluid by 10 percent or more when compared to commonly available alternative equipment. The term does not include a motor or downhole pump. Equipment does not qualify as enhanced efficiency equipment unless an institution of higher education approved by the comptroller that is located in this state and that has an accredited petroleum engineering program evaluated the equipment and determined that the equipment does produce the required energy reduction.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.061
State	Utah
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(6)
Title	<i>Workovers/Recompletions</i>
Discussion	A working interest owner who pays for all or part of the expenses of a recompletion or workover is entitled to a nonrefundable tax credit equal to 20 percent of those expenses. The tax credit may not exceed \$30,000 per well during each calendar year.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102
State	Wyoming
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	Workover wells are exempt from severance taxes for a period of 24 months immediately following the workover or recompletion.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2

2010 Incentives by State

Alabama

Alabama

Topic:	Coalbed Methane (CBM)
Category	Laws and Regulation
Citation	Ala. Code §§ 9-17-1, 9-17-6, 9-17-12
Title	<i>Drainage or Production Units</i>
Discussion	Allows a second well to be drilled and produced within 80-acre drainage or production units in coalbed methane fields.
URL	http://www.gsa.state.al.us/ogb/statutes.aspx#http://www.gsa.state.al.us/ogb/statutes.aspx
Topic:	Data Access
Category	Resource
Citation	Rule 400-1-3-.10 of the Code of Alabama (1975)
Title	<i>Geophysical Logs; Core and Sample Library</i>
Discussion	Alabama's Oil and Gas Board, working in conjunction with the Geological Survey of Alabama, began in 2001 to generate digital copies of all well geophysical logs, 49,100 in all. Historically, the Oil and Gas Board required operators to submit two hard copies of all logs. The board stored one log as a permanent record and made the other available for copying. Now, only one copy is required, and when the office receives logs, workers scan them for digital storage, reducing both paper and space requirements. Since the public learned that they can access well logs digitally, orders for those files have far exceeded requests for paper copies (IOGCC, 2008). Alabama is also working to add digital files of other historic documents and scanning new files as they come in to further streamline operations, and staff is working to develop online permitting and reporting capabilities. The state believes that having more information digitally accessible, especially well logs, encourages oil and gas companies to spend their exploration dollars in Alabama rather than another state that has incomplete or inaccessible data. The Geological Survey of Alabama maintains a core and well sample library that includes cuttings from 4,000 oil and gas wells, core from 1,700 oil and gas wells, cuttings from 2,800 water and stratigraphic test wells and core from 350 industrial mineral core holes. Rules and regulations of the Oil and Gas Board require that exploration companies submit cores and drill cuttings following the completion of wells. Rule 400-1-3-.10 of the Code of Alabama 1975 states in part that "a complete set of cuttings, correctly labeled and identified as to depth, shall be filed with the board within 30 days from the time of completion of any well unless otherwise approved by the supervisor. If cores are taken, a

Alabama

	complete set of cores, either whole or at least quarter slabs, correctly labeled and identified as to depth, shall be filed with the board within six months from the time of completion of any well unless otherwise approved by the supervisor." The facility has four viewing rooms for use by operators and researchers. Goals: To encourage oil and gas production by making useful data available to producers and to counteract the loss of infrastructure in the independent industry
URL	
Topic:	Deep Wells
Category	Tax incentive
Citation	Ala. Code § 40-20-2(a)(7) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	The code applies to offshore wells permitted after July 1, 1998, with a borehole depth greater than 18,000 feet. A privilege tax reduction from 6% (see Ala. Code 40-2-2(a)(5) (1975)) to 4% is available.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	Ala. Code § 40-20-2(a)(2) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Reduces the privilege tax to 4% for incremental production from qualified enhanced oil recovery projects and supplemental enhanced recovery projects. The State Oil and Gas Board of Alabama approves the project and calculates "incremental production" by determining a base production rate.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm#E:\2008 Incentives by state.xls#Sheet1!F7
Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	Ala. Code § 40-20-2(b) (1975)

Alabama

Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Exempts natural gas lawfully injected for the purpose of lifting oil or gas from privilege taxes.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
Topic:	Marginal Wells
Category	Tax incentive
Citation	Ala. Code § 40-20-2(a)(3) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Reduces the privilege tax to 4% of value on wells producing 25 barrels of oil or less per day, or 200 Mcf per day of natural gas.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
Topic:	New Production
Category	Tax incentive
Citation	Ala. Code § 40-20-2(a)(8) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Reduces production and privilege taxes for oil and gas wells permitted on or after July 1, 1996, and before July 1, 2002, except a replacement well for which the initial permit was issued before July 1, 1996. Applicable rate is reduced 50% for five years.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
Topic:	Offshore Production
Category	Tax incentive
Citation	Ala. Code § 40-20-2(a)(5) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>

Alabama

Discussion	A privilege tax reduction to 6% is available for offshore wells permitted before July 1, 1988, with a borehole depth greater than 18,000 feet. The wells must be drilled offshore in state waters.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
Topic:	Offshore Production
Category	Tax incentive
Citation	Ala. Code § 40-20-2(a)(5) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	This code reduces the privilege tax to 6% for offshore wells permitted before July 1, 1988, with a borehole depth greater than 18,000 feet. The wells must be drilled offshore in state waters.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
Topic:	Offshore Production
Category	Tax incentive
Citation	Ala. Code § 40-20-2(a)(7) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Reduces privilege tax from 6% (see Ala. Code 40-2-2(a)(5) (1975)) to 4% for offshore wells permitted after July 1, 1988, with a borehole depth greater than 18,000 feet.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
Topic:	On-site Use of Produced Oil/Gas
Category	Tax incentive
Citation	Ala. Code § 40-20-2(b) (1975)
Title	<i>Levy and Amount of Tax Upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Exempts from privilege taxes natural gas lawfully injected for the purpose of lifting oil or

Alabama

	gas.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	Ala. Code § 9-17-33
Title	<i>Disposition of proceeds derived from sale of oil or gas producti</i>
Discussion	Increases the minimum royalty payment threshold to \$100
URL	
Topic:	Shale Gas
Category	Laws and Regulation
Citation	Ala. Code §§ 9-17-1, 9-17-6, 9-17-12
Title	<i>Drainage or Production Units</i>
Discussion	Allows more than one well to be drilled and produced within the drainage or production units in shale gas fields.
URL	http://www.gsa.state.al.us/ogb/statutes.aspx#http://www.gsa.state.al.us/ogb/statutes.aspx
Topic:	Unitization
Category	Tax incentive
Citation	Ala. Code § 40-20-2(e) (1975)
Title	<i>Levy and Amount of Tax upon Business of Producing or Severing Oil or Gas from Soil, etc., Generally.</i>
Discussion	Computes per well production of oil from unit operations for tax purposes based on aggregate production of oil from the entire unit divided by the number of wells within the unit, including injection, disposal and other wells utilized in unit operations.
URL	http://alisondb.legislature.state.al.us/acas/codeofalabama/1975/40-20-2.htm

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Topic:	Unitization
Category	Tax incentive
Citation	Ala. Code § 9-17-85
Title	<i>Ratification</i>
Discussion	Reduces the percentage from 75% to 66 2/3% for ratification of a unit agreement under the terms of the allocation formula established by the State Oil and Gas Board and for ratification of an addition to the unit area.
URL	http://www.gsa.state.al.us/ogb/statutes.aspx

Alaska

Alaska

Topic:	Discovery Wells
Category	Tax incentive
Citation	Alaska Stat. § 43.55.025
Title	<i>Alternative Tax Credit for Oil and Gas Exploration</i>
Discussion	Tax credits for discovery wells
URL	http://www.touchngo.com/lglcntr/akstats/Statutes/Title43/Chapter55/Section025.htm#E:\2008 Incentives by state.xls#Sheet1!F5
Topic:	Education
Category	Tax incentive
Citation	Alaska Stat. § 43.55.019
Title	<i>Oil or Gas Producer Tax Credit</i>
Discussion	Credit against tax due for cash contributions is excepted for instruction, research, and educational support services by Alaska University or secondary vocational education, and programs by Alaska school districts.
URL	http://www.touchngo.com/lglcntr/akstats/Statutes/Title43/Chapter55/Section019.htm
Topic:	Hydraulic Fracturing
Category	Tax incentive
Citation	Alaska Stat. §31.05.030 (j)(2)(a) - (d)
Title	<i>For Exploration and Development Operations Involving Nonconventional Gas</i>
Discussion	See Alaska Stat. §31.05.030 (j)(1)(a)
URL	
Topic:	Hydraulic fracturing
Category	Laws and Regulation
Citation	Alaska Stat. §31.05.030 (j)(2)(a) - (d)

Alaska

Title	<i>For Exploration and Development Operations Involving Nonconventional Gas</i>
Discussion	This statute lists stipulations concerning permitting, produced water injection, hydraulic fracturing, waste disposal, and water quality related to nonconventional gas exploration and development.
URL	
Topic:	Increasing production
Category	Tax incentive
Citation	Alaska Stat. § 43.55.023
Title	<i>Tax Credits for Certain Losses and Expenditures; Tax Credits for Qualified Capital Expenditures</i>
Discussion	
URL	http://www.touchngo.com/lglcntr/akstats/Statutes/Title43/Chapter55/Section025.htm
Topic:	Increasing production
Category	Tax incentive
Citation	Alaska Stat. § 43.55.165
Title	<i>Lease Expenditures</i>
Discussion	Qualified lease expenditures are deductible
URL	http://www.touchngo.com/lglcntr/akstats/Statutes/Title43/Chapter55/Section165.htm
Topic:	Increasing production
Category	Tax incentive
Citation	Alaska Stat. § 44.55.024
Title	<i>Additional Nontransferable Credits</i>
Discussion	For a calendar year for which a producer's tax liability under AS 43.55.011 (e) on oil and gas produced from leases or properties outside the Cook Inlet sedimentary basin, no part of which is north of 68 degrees North latitude, exceeds zero before application of any credits under this chapter, a producer that is qualified under (e) of this section may apply a tax credit against that liability of not more than \$6 million.

Alaska

URL	
Topic:	Marginal Wells
Category	Tax incentive
Citation	Alaska Stat. § 38.05.180(f)(6)
Title	<i>Oil and Gas and Gas Only Leasing</i>
Discussion	The statute reduces royalty for oil from platforms in the Cook Inlet Basin that produce less than 1,200 bpd.
URL	http://www.touchngo.com/lglcntr/akstats/Statutes/Title38/Chapter05/Section180.htm

Arizona

Arizona

Topic:	Discovery Wells
Category	Tax incentive
Citation	Ariz. Rev. Stat 42-15001
Title	<i>Assessed Value of Class I Property</i>
Discussion	The Property Tax Reform and Reduction Act, passed by the 42nd Legislature in July 1996, reduced the property tax assessment ratio for all real and personal property used by producing oil, gas, and geothermal interests to 28% of full cash value from 100%. The tax rate will decrease an additional 1% per year until holding at 25% in 1999 through December 2005, 24.5% through December 2006, 24% through December 2007, 23% through December 2008, 22% through December 2009, 21% through December 2010, and 20% beginning from and after December 31, 2010.
URL	# http://www.azleg.state.az.us/FormatDocument.asp?inDoc=/ars/42/15001.htm&Title=42&DocType=ARS#

Arkansas

Arkansas

Topic:	Coalbed Methane (CBM)
Category	Tax incentive
Citation	Ark. Code Ann. §26-58-111
Title	<i>Rates of Tax</i>
Discussion	Coalbed methane wells receive a reduction in severance tax from 5% to 1.5% for 36 to 48 months depending on payout.
URL	# http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm#
Topic:	Data Access
Category	Resource
Citation	
Title	<i>Fayetteville Shale Natural Gas -- Reducing Environmental Impacts (Website)</i>
Discussion	The University of Arkansas and Argonne National Laboratory developed a web-based software application designed to help small E&P companies reduce environmental impacts while developing the low-permeability, tight gas shales of the Fayetteville Shale. Developers designed the tool to help producers navigate federal and state regulatory requirements and evaluate alternative leasing layouts to manage development with an eye toward environmental protection. ("Fayetteville Shale: Reducing the environmental impact of natural gas development")
URL	# http://lingo.cast.uark.edu/LINGOPUBLIC/#
Topic:	Deep Wells
Category	Tax incentive
Citation	Ark. Stat. 26-58-101
Title	
Discussion	Wells greater than 12,500 feet measured depth receive a reduction in severance tax from 5% to 1.5% for 24 months.
URL	

Arkansas

Topic:	Discovery Wells
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1001
Title	<i>Tax Incentives — Increased Volume by Enhanced Recovery</i>
Discussion	New discovery oil wells receive a 75% severance tax credit for taxes otherwise due for 5 to 10 years, depending on depth of well.
URL	# http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1001.htm#
Topic:	Discovery Wells
Category	Tax incentive
Citation	Ark. Code Ann. §26-58-111
Title	<i>Rates of Tax</i>
Discussion	New discovery gas wells in conventional source of supply receive reduction in severance tax from 5% to 1.5% for 24 months.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm#http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm#
Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1001
Title	<i>Tax Incentives — Increased Volume by Enhanced Recovery</i>
Discussion	EOR projects approved by the Oil and Gas Commission are entitled to a 50% reduction in severance taxes for the incremental volume of oil attributable to the project.
URL	# http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1001.htm#
Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1003
Title	<i>Tax Incentives -- Increased Volume by New Research Technology</i>

Arkansas

Discussion	Incremental production oil due to application of new research technologies approved by the Oil and Gas Commission is exempt from severance tax.
URL	#http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1003.htm#
Topic:	Marginal Wells
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1002
Title	<i>Tax Incentives — Re-establishment of Inactive Wells and Fields</i>
Discussion	The severance tax is reduced from 5% to 4% for marginal wells, which are defined by the state as wellsthat produce an average of less than 10 barrels of oil per day during any calendar month.
URL	#http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1002.htm#
Topic:	Marginal Wells
Category	Tax incentive
Citation	Ark. Code Ann. §26-58-111
Title	<i>Rates of Tax</i>
Discussion	Marginal Gas Wells. there is a reduction in the severance tax from 5% to 1.25% for conventional sources of supply producing less than 100 Mcf/day and for unconventional and tight sand sources of supply producing less than 250 Mcf/day.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm#http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm#
Topic:	New Technology Usage
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1003
Title	<i>Tax Incentives -- Increased Volume by New Research Technology</i>
Discussion	Incremental production oil due to application of new research technologies approved by the Oil and Gas Commission is exempt from the severance tax.

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URL	#http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1003.htm#
Topic:	New technology usage
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § B-42
Title	<i>Seismic Rules and Regulations</i>
Discussion	This amendment clarified the area covered by a permit with respect to 2-D and 3-D seismic methods. 2-D – permit area is ½ mile on each side of line location, referred to as “2-D seismic line corridor.” 3-D – permit area is based on outline of designated area where shoot will occur. The rule expressly states many operation requirements that previously were located only on the issued permit and also imposes additional operation requirements that were not included in the issued permit. The rule clarifies how notice is to be given, and who is entitled to notice prior to commencement of seismic operations. Entitled to notice are operators within the “area”, surface owners, and surface occupants who are not owners.
URL	
Topic:	Orphaned and Abandoned Wells
Category	Laws and Regulation
Citation	Arkansas Oil and Gas Commission General Rules and Regulations § G-1, G-2, G3
Title	<i>Abandoned, Orphan or Leaking Wells</i>
Discussion	The amendment defines abandoned wells as those not having produced for 2 years, those without payment of annual well fees, wells not plugged in accordance with order, etc. The director may bring application to the Commission to request abandonment determination. The operator must repay any funds expended by the Commission Well site equipment, including any hydrocarbons, may be disposed to offset plugging costs. The bill also provides administrative procedures to request transfer of abandoned or orphaned wells to another operator, as opposed to AOGC plugging; to acquire a signed, properly recorded lease; and to pay salvage value for any equipment at the well. The director has discretion to approve or deny any transfer requests. Decisions may be appealed to the Commission (\$250 fee – A-3).prior to issuance of any further drilling permits, and additional bonding may be required. The bill defines orphaned wellsas those where the permit holder can’t be located; those where the well isn’t covered by a bond from the last operator; and those where annual well fees have never been paid. If a well satisfies the criteria, the director

Arkansas

	administratively determines the well to be orphaned, which authorizes expenditures of funds to plug the well.
URL	
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § A-8
Title	<i>Reporting Requirements for Mineral Proceeds Escrow Accounts</i>
Discussion	The new rule establishes specific requirements for reporting of funds held for the benefit of unknown or unlocatable mineral owners. The requirements: *Must hold funds in an account with a bank licensed to do business in Arkansas. *Must file an annual report detailing the following: name and address of owner; legal description of property interest; location of number of account; persons authorized to withdraw from account; and whatever information the AOGC may require. The report is to be filed by February 1 every year, and there will be a civil penalty of up to \$1,000 for each violation.
URL	
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § B-11
Title	<i>Natural Gas or Fresh Water Supply Wells for Domestic Use</i>
Discussion	This new rule provides methodology for the transfer of natural gas production wells to landowners for domestic use purposes. Production may be used only on property where the well is located. Written agreement from all owners must be filed. the rule provides methodology for the transfer of natural gas or oil production wells to landowners for use as domestic water supply wells.
URL	
Topic:	Regulatory Streamlining
Category	Laws and Regulation

Arkansas

Citation	Arkansas Oil & Gas Commission General Rules and Regulations § B-40
Title	<i>Administrative Approval of Exceptional Locations</i>
Discussion	The amendment allows administrative approval for wells that have been drilled, but prior to commencement of production. If administrative application is denied, the applicant may request a hearing in accordance with A-2 and A-3, except that no additional fee is required. It authorizes administrative approval for sharing an exceptionally located well between two or more integrated drilling units, which are held by production, based upon any “calculated area” (shape) that all working interest owners in all units agree upon. The director has discretion to refer the application to the Commission for a hearing.
URL	
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § D-17
Title	<i>Regulation of Natural Gas Pipelines</i>
Discussion	This amendment clarifies that Arkansas Oil and Gas Commission (AOGC) jurisdiction includes all types of pipelines upstream of custody transfer, not just type gathering lines. It exempts pipeline systems less than 1 mile in length, and which do not cross public roads, railroads, or perennial streams from paying the permit fee. It also establishes requirements for lines not subject to federal regulation; clarifies incorporation of federal construction, operation, and maintenance requirements into state regulation; And specifies additional requirements for pipelines containing Hydrogen Sulfide.
URL	
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § E-3
Title	<i>Exploration and Production Fluid Handling and Transportation</i>
Discussion	The new rule requires each “transporter” using motor vehicles to transport exploration and production fluid (excludes fresh water) to be permitted. Each transporter is required to submit a Form 1 Organization Report, and a Form 32, along with applicable application fee (\$100 per tank). A permit sticker is to be placed at the rear of each transportation tank. Each transporter shall be in compliance with this rule by March 30, 2009. Manifests must be maintained to show produced fluids received, transporter, delivery, and disposal.

Arkansas

URL	
Topic:	Returning Idle Wells to Production
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1002
Title	<i>Tax Incentives — Reestablishment of Inactive Wells and Fields</i>
Discussion	Idle and inactive oil wells (no production for 12 consecutive months) that are restored and re-established as producing wells are exempted from severance taxes for 10 years from the date of renewed production.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1002.htm#http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1002.htm#
Topic:	Returning Idle Wells to Production
Category	Tax incentive
Citation	Ark. Code Ann. §15-72-1002
Title	<i>Tax Incentives — Reestablishment of Inactive Wells and Fields</i>
Discussion	An inactive oilfield that is later returned to production shall be exempted from severance taxes for oil produced from all zones, horizons, and formations that were once productive but have ceased to produce.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/18/15-72-1002.htm#
Topic:	Site Preparation
Category	Laws and Regulation
Citation	Arkansas Oil & Gas Commission General Rules and Regulations § B-26
Title	<i>General Lease Operating Requirements</i>
Discussion	The 2009 amendment requires wellhead area and related production equipment to be kept free of excessive vegetation and maintained in a “safe and good working condition.” It prohibits disposal of used refined oil in produced water storage tanks, and specifies that disposal must be in accordance with ADEQ regulations. It also authorizes storage of equipment to be used on the lease without express written consent of the landowner and clarifies that unusable or unrepairable above ground piping and flowlines and concrete must be removed.

Arkansas

URL	
Topic:	Tight Sands
Category	Tax incentive
Citation	Ark. Code Ann. §26-58-111
Title	<i>Rates of Tax</i>
Discussion	Tight sands and unconventional sources receive a severance tax reduction from 5% to 1.5% for 36 to 48 months depending on well payout.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm#http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-111.htm
Topic:	Water Management
Category	Tax incentive
Citation	Ark. Code Ann. §26-58-209
Title	<i>Cost of Maintaining Saltwater Disposal System</i>
Discussion	Severance tax credit for saltwater disposal costs is available for production from wells that produce both oil or gas and saltwater. Costs include depreciation of cash investment, maintaining and improving the system, costs of services, labor, supplies, utilities and other operating expenses.
URL	http://www.arkleg.state.ar.us/assembly/ArkansasCode/1/26-58-209.htm

California

California

Topic:	Data Access
Category	Resource
Citation	
Title	<i>Web-based Access to Data and Information</i>
Discussion	California's Department of Oil, Gas Geothermal Resources offers comprehensive web-based access to data and information. Online mapping, online production and injection data, and online well record searches can all be conducted from their web site.
URL	
Topic:	On-site Use of Produced Oil/Gas
Category	Tax incentive
Citation	Cal. Pub. Res Code § 3403
Title	<i>Charge for Gas</i>
Discussion	Natural gas used on-site for pressure-maintenance or other producing operations is exempt from assessment.
URL	
Topic:	Orphaned and Abandoned Wells
Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3204
Title	<i>Individual Bond</i>
Discussion	See Cal. Pub. Res Code § 3206
URL	
Topic:	Orphaned and Abandoned Wells
Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3205

California

Title	<i>Blanket Bond</i>
Discussion	See Cal. Pub. Res Code § 3206
URL	
Topic:	Orphaned and Abandoned Wells
Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3205.5
Title	<i>Cash Bonds</i>
Discussion	See Cal. Pub. Res Code § 3206
URL	
Topic:	Orphaned and Abandoned Wells
Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3206
Title	<i>Long-term Idle Well Bonds/Fees</i>
Discussion	In response to the growing number of idle and orphaned wells, bonding levels for active and long-term idle wells and idle well fees were increased to provide more financial assurance and more funding to plug existing orphaned wells.
URL	
Topic:	Orphaned and Abandoned Wells
Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3238
Title	<i>Charges for Certain Wells</i>
Discussion	California provides a 10-year abeyance of the assessment on oil and gas produced from orphaned wells and wells that have been idle for five or more years when they are returned to productive status. Furthermore, the State Oil and Gas Supervisor may permit an operator to evaluate the economic viability of an orphaned well for 90 days without having to provide bond coverage or assume plugging responsibility for the "adopted" orphaned well.

California

URL	
Topic:	Orphaned and Abandoned Wells
Category	Laws and Regulation
Citation	Cal. Pub. Res Code § 3258
Title	<i>Division Expenditures</i>
Discussion	The orphaned well plugging fund is doubled from \$1 million annually to \$2 million annually for a period of four years.
URL	
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	AB 1234
Title	<i>Transfer of Pipeline Right of Way</i>
Discussion	This law allows a utility to transfer easements and right of ways associated with a section of gathering pipeline to an individual producer or a cooperative of producers.
URL	
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	AB 1960
Title	<i>Article 4.4 Regulation of Production Facilities</i>
Discussion	New legislation was passed giving the California Division of Oil, Gas, and Geothermal Resources (DOGGR) specific authority to regulate oilfield production facilities. DOGGR did not have this specific authority until now.
URL	

Colorado

Colorado

Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	Colo. Rev. Stat. § 39-7-102(2)(a) and (b)
Title	<i>Valuation for Assessment</i>
Discussion	Oil and gas leasehold and lands employing secondary/tertiary recovery or recycling projects are assessed at 75% of the annual gross production value.
URL	
Topic:	Marginal Wells
Category	Tax incentive
Citation	Colo. Rev. Stat. § 39-29-105
Title	<i>Tax on Severance of Oil and Gas</i>
Discussion	Oil and gas income from "stripper wells," i.e., wells that produce an average of 15 barrels or less of oil per producing day or 90,000 cubic feet of gas per producing day, is exempt from severance tax. A tax credit is available for 87.5% of ad valorem tax.
URL	
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	
Title	<i>New Rule Development</i>
Discussion	Colorado promulgated new rules and procedures effective May 1, 2009, to address increases in oil and gas activity in the state. In 2007, upon the urging and initiative of the Colorado Department of Natural Resources, the General Assembly passed legislation to increase the Commission's regulatory authority and oversight obligations to better address the potential adverse impacts that can accompany oil and gas development. The General Assembly declared that it is in the public's interest to foster the responsible, balanced development of Colorado's oil and gas resources consistent with the protection of public health, safety, and welfare, including

Colorado

	protection of the environment and wildlife resources. C.R.S. § 34-60-102(1). (cogcc.state.co.us).
URL	

Illinois

Florida

Topic:	Marginal Wells
Category	Tax incentive
Citation	Fla. Stat. Title XIV, § 211.02, and Chapter 86-178 (1986)
Title	<i>Oil Production Tax; Basis and Rate of Tax; Tertiary Oil</i>
Discussion	Marginal/Stripper Wells. The severance tax is reduced from 8% to 5% for oil wells producing less than 100 barrels per day. Stripper gas is taxed at \$0.12 Mcf.
URL	
Topic:	On-site Use of Produced Oil/Gas
Category	Tax incentive
Citation	Fla. Stat. Title XIV, § 211.027 (1)
Title	<i>Exemption for On-site Use of Production</i>
Discussion	Oil and gas produced and used on-site are exempt from severance taxes.
URL	

Illinois

Illinois

Topic:	Orphaned and Abandoned Wells
Category	Tax incentive
Citation	Illinois Public Act 094-1085
Title	<i>Crude Oil Marketing and Education Act</i>
Discussion	This voluntary program is modeled after the Oklahoma Energy Resources Board. A tax of 1/10th of 1% of gross revenue of crude oil sales is collected into a fund. One-half of the fund is dedicated to abandoned oilfield site cleanup and the other half funds energy education in public schools.
URL	http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1392&ChapAct=225 ILCS 728/&ChapterID=24&ChapterName=PROFESSIONS AND OCCUPATIONS&ActName=Illinois Petroleum

Kansas

Kansas

Topic:	Carbon Capture, Geologic Storage, and Transportation (CCGST)
Category	Laws and Regulation
Citation	Kansas HB 2419
Title	<i>AN ACT enacting the carbon dioxide reduction act; providing for income tax reductions and property tax exemptions; providing for regulation of carbon dioxide injection wells;</i>
Discussion	The State of Kansas passed HB 2419 in 2007 that mandated development of regulations by July 1 of 2008. The Kansas statute is limited in scope and primarily mandates development of the regulations for CO ₂ injection wells. Regulations have been published and are open for comment. The rules are largely based on the IOGCC model, the state's gas storage regulations, and the UIC Rule proposed by the EPA. A public hearing for K.A.R. 82-3-1117 is scheduled for January 6, 2010.
URL	
Topic:	Data Access
Category	Resource
Citation	
Title	<i>Simplified On-Line Automated Reporting (SOLAR)</i>
Discussion	The Kansas Corporation Commission (KCC) has been working with the University of Kansas on a Website application that eventually will link operations between the Kansas Geological Society, the Department of Revenue, county appraisers, and the Commission. Operators can create their own account online that they can use to file for drilling permits, check the status of applications, report revenues, and other tasks that once required paper and a trip to the office. The project, which Kansas calls SOLAR for Simplified On-Line Automated Reporting, has been extremely successful. Implemented in the spring of 2008, the program was receiving half of the permit applications online by September. According to Doug Louis, Director of the KCC Conservation Division, the success lies in careful beta-testing to work out glitches before the roll-out of the product. Louis says that the system cuts down on the number of calls that office personnel must handle. Another benefit of the system is accuracy; SOLAR has a built-in "dummy check" that will not allow a permit application to go forward online if the location does not match a location on the system. (IOGCC, 2008)
URL	

Kansas

Topic:	Data Access
Category	Resource
Citation	Kan. Stat. Ann. § 76-322
Title	<i>Kansas Geological Survey</i>
Discussion	The Kansas Geological Survey (KGS) conducts research and provides information about the state's petroleum resources. KGS conducts programs for the petroleum industry so the state will continue to enjoy the benefits of revenue generated by the industry and provides the petroleum industry with the benefits of research and information, as the state land grant schools provide support to the agricultural industry. This is to encourage the development of natural resources of economic value. Impact: Oilfields have been discovered based on KGS research. The KGS is widely recognized as being the source of much petroleum information and for its work on problems posed by the industry. The survey frequently appears before legislative committees to support tax incentives and provides technical assistance to the industry.
URL	
Topic:	Discovery Wells
Category	Tax incentive
Citation	Kan. Admin. Regs. §82-3-312
Title	<i>Gas Allowables and Drilling Unit</i>
Discussion	This regulation increased the daily allowable from 25% of the well's calculated absolute open-flow (AOF) to 50% of AOF. This amended rule also raises the minimum gas allowable from 150 Mcfpd to 250 Mcfpd.
URL	http://www.kcc.state.ks.us/conservation/cons_rr_110308.pdf
Topic:	Discovery Wells
Category	Tax incentive
Citation	Kan. Stat. Ann. § 76-323
Title	<i>State Geological Survey; Chancellor Ex Officio Director; State Geologist, Appointment, Unclassified</i>
Discussion	See Kan. Stat. Ann. § 76-322

Kansas

URL	
Topic:	Discovery Wells
Category	Tax incentive
Citation	Kan. Stat. Ann. § 76-326
Title	<i>Geological Survey with Reference to Natural Products of Economic Importance</i>
Discussion	See Kan. Stat. Ann. § 76-322
URL	
Topic:	Discovery Wells
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217(b)(1)
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	Natural gas used in injection projects, for fuel in recovery operations, or from a well having an average daily production with a value not more than \$87, is exempt from severance and production taxes.
URL	
Topic:	Discovery Wells
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217(b)(4)
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	New Wells/New Pools. Production from new pools is exempt from severance tax for 24 months from commencement of production.
URL	
Topic:	Economic Stimulation
Category	
Citation	Kan. Stat. Ann. § 79-32-208

Kansas

Title	<i>Mineral severance tax; imposition of tax; rate; measurement of production; exemptions</i>
Discussion	Refundable Income Tax Credit for Property Taxes Paid. Working interest owners can receive an income tax credit equal to 75% of the 1998 personal property tax paid on the working interest of an oil lease, from which the average daily production per well is 15 barrels or less. The property tax must have been levied for property tax year 1998 and timely paid during the income tax year in which the credit is taken. By making the credit effective for the tax year beginning after Dec. 31, 1997, immediate relief is available. For taxable years commencing after Dec. 31, 1998, an income tax credit is allowed equal to 50% of the property tax paid for wells producing 15 barrels or less per day when the price per barrel is \$16 or less. The amount of the credit which exceeds the tax liability is refundable.
URL	
Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	Secondary/Tertiary Recovery. Incremental production resulting from a tertiary recovery process is exempt from severance and production taxes. Incremental Production. A severance tax exemption for a period of seven years is given to the incremental production resulting from a production enhancement project begun on or after July 1, 1998. Incremental severance and production is defined as production in excess of base production. Base production is the average monthly amount of production for the 12-month period immediately prior to the project beginning date, minus the monthly rate of production decline. The monthly rate of production decline would be determined with reference to the same 12-month period used to determine the base production. The monthly rate of production decline is the decline that would have occurred except for the enhancement project. The credit does not apply in any fiscal year if in the preceding calendar year the price exceeded, in the case of oil, \$20 per barrel; or, in the case of natural gas, \$2.50 per Mcf. Language was added to clarify the existing law to include wells that have an established incline in production volumes and for wells that have had casing failures (or for other reasons lack production volumes) immediately prior to the enhancement project.
URL	
Topic:	Increasing production
Category	Tax incentive

Kansas

Citation	Kan. Stat. Ann. § 79-331
Title	<i>Listing Property for Taxation</i>
Discussion	Property Taxation. This act relates to the property tax valuation of oil and gas properties. Factors to be considered when assessing property taxes include the age of the well, quality of product produced, nearness to market, the cost of operation, the probable life of the well, character, extent and permanency of market, the quantity of product produced, the number of wells being operated and other factors affecting the value of the lease. The act also establishes the method for calculating the property taxes.
URL	
Topic:	Increasing production
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	Natural Gas Severance Tax Reduction. Legislators enacted an annual stepped reduction in severance tax on natural gas from 7% to 4.33% over a three-year period. The final reduction took place in July of 1996.
URL	
Topic:	Marginal Wells
Category	Laws and Regulation
Citation	Kan. Admin. Regs. §82-3-304
Title	<i>Tests of Gas Wells; Penalty</i>
Discussion	Tests of Gas Wells. This regulation increased the daily minimum gas allowable in Kansas from 150 to 250 Mcf per day and exempts such minimum gas wells from the burden of annual gas well testing (including the required 72-hour shut-in period). It requires that the operator must apply for the exemption and annually report to the Kansas Corporation Commission the well head shut-in pressure for such minimum wells that have been exempted. This includes all coal seam gas wells and conventional gas wells that produce less than 250 Mcf per day. This incentive is designed to minimize the loss of gas production sales and associated expenses of the gas well test (pulling unit time, labor, etc.) for minimum wells.

Kansas

URL	http://www.kcc.state.ks.us/conservation/cons_rr_110308.pdf
Topic:	Marginal Wells
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217(b)(1)
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	Marginal/Stripper Wells. The existing severance tax exemptions for marginal/stripper wells was expanded to increase exemptions and to allow for further increases in exemption amounts if oil prices decrease. The two barrels of oil per day exemption on oil produced from a lease or production unit increased to an average daily production of five. The three-barrel exemption for wells with a completion depth of 2,000 feet or more increased to an average daily production of six barrels per day. Further exemptions were provided for if the price of oil decreases. Oil priced at \$16 or less now has a seven barrel exemption; should oil drop to \$13 per barrel, the exemption is 10 barrels. Tertiary recovery from a waterflood process from wells of 2,000 feet or less now has a six barrel exemption and wells in excess of 2,000 feet have a seven barrel exemption. The exemption is 10 if the oil price reaches \$14 per barrel. Tertiary recovery oil priced at \$16 or less now has an eight barrel exemption and \$14 oil would have a 10 barrel exemption. The exemption for gas severed from a well having a gross value of not more than \$81 per day during a calendar month was increased to \$87
URL	
Topic:	Marginal Wells
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-4217(b)(2)
Title	<i>Mineral Severance Tax; Imposition of Tax; Rate; Measurement of Production; Exemptions</i>
Discussion	See Kan. Stat. Ann. § 79-4217(b)(1)
URL	
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	Kan. Stat. Ann. § 55-1624
Title	<i>FERC-Ordered Refunds of Tax Reimbursements; Recovery</i>

Kansas

Discussion	Royalty Interests, Statute of Limitations on FERC-Ordered Refunds. The period of time during which first sellers of natural gas could commence a civil action against royalty interest owners to obtain refunds of reimbursements for ad valorem taxes on royalty interests during the years 1983 through 1988 was declared expired and the refund claims were deemed to be uncollectible. The legislature reaffirmed that the Kansas five-year statute of limitations found in K.S.A. 60-511 applied to these claims created when the Federal Energy Regulatory Commission (FERC), more than 15 years after its initial determination, reversed its long-standing policy that the Kansas ad valorem tax, which was based on production, was a severance tax and could be added to the maximum lawful price set by the NGPA at that time. FERC ordered first sellers to refund the amount of the ad valorem tax. This statute and that part of the FERC order relating to penalty and interest is under court challenge in both state and federal courts.
URL	
Topic:	Services
Category	Tax incentive
Citation	Kan. Stat. Ann. § 79-3606 (kk)(1)(c)
Title	<i>Kansas Retailers' Sales Tax</i>
Discussion	Electricity and other utilities used in the severance of oil and gas are exempt from the state sales tax.
URL	
Topic:	Temporary Abandonment
Category	Laws and Regulation
Citation	Kan. Admin. Regs. § 82-3-111
Title	<i>Temporarily Abandoned Wells; Penalty; Plugging.</i>
Discussion	This regulation allows operators more than 90 days of non-production before having to file a temporary abandonment (TA) application. It also provides a framework for non-producing wells that may be fully equipped and capable of production relief from filing for TA approval up to 364 days of non-production and extends the 90-day time requirement for plugging or returning a well back into service. This is to allow operators more time to re-work and re-establish production for wells that may be non-producing for more than 90 days due to low product price or inability to obtain service equipment (pulling units, parts, etc.), without the formal filing of a TA application.

Kansas

URL	http://www.kcc.state.ks.us/conservation/cons_rr_0704.pdf
Topic:	Temporary Abandonment
Category	Laws and Regulation
Citation	Kan. Admin. Regs. § 82-3-111 (b)
Title	<i>Temporarily Abandoned Wells; Penalty; Plugging</i>
Discussion	Regulations for temporarily abandoned wells have been modified, placing a cap of 10 years on temporarily abandoned wells.
URL	http://www.kcc.state.ks.us/conservation/cons_rr_0704.pdf
Topic:	Unitization
Category	Tax incentive
Citation	Kan. Stat. Ann. § 55-1304
Title	<i>Oil and Gas; Unitization</i>
Discussion	This act empowers the Kansas Corporation Commission (KCC) to unitize a pool upon request of a working interest owner under certain circumstances. First, the primary production from a pool has reached a low economic level and without introduction of artificial energy, abandonment of the well is imminent; or the unitized management sought is economically feasible and necessary to prevent waste. Second, the value of the estimated recovery is greater than the costs incident to conducting the recovery. Finally, the operation is fair and equitable. The act further establishes the rights of owners of oil and gas rights under unleased land as being a working interest to the extent of 7/8 interest and a royalty owner to the extent of 1/8 interest. The KCC can alter the extent of a royalty interest. Finally, the act states that it is the duty of the operator of the unit to file ad valorem taxes.
URL	
Topic:	Unitization
Category	Tax incentive
Citation	Kan. Stat. Ann. § 55-1305
Title	<i>Matters to Be Found by the Commission Precedent to Issuance of Unitization Orders; Hearings</i>

Kansas

Discussion	See Kan. Stat. Ann. § 55-1304
URL	
Topic:	Unitization
Category	Tax incentive
Citation	Kan. Stat. Ann. § 55-1308
Title	<i>Commission Orders</i>
Discussion	See Kan. Stat. Ann. § 55-1304
URL	
Topic:	Unitization
Category	Tax incentive
Citation	Kan. Stat. Ann. § 55-1312
Title	<i>Rendition for Taxation of Property Used by Unit; Assessment and Taxation</i>
Discussion	See Kan. Stat. Ann. § 55-1304
URL	
Topic:	Unitization
Category	Tax incentive
Citation	Kan. Stat. Ann. § 55-1316
Title	<i>Oil and Gas; Unitization; Definition of "Pool"; Legislative Intent</i>
Discussion	K.S.A. 55-1316 changed the definition of “pool” as it relates to the underground accumulation of oil and gas. This statute change expanded the definition of a “pool” to include “one or more natural reservoirs that are pressure connected.” This statutory change now allows for unitization in pools that have commingled production from more than one reservoir due to pressure communication within the wellbore. Additionally, K.S.A. 1317 provides that if at least 90% or more of the working interest owners approve, in writing, a contract for the unit operations of a pool or part of a pool, then the unit operations becomes effective without application to or order by the Kansas Corporation Commission. These statutes are part of Article 13 of Chapter 55 of the Kansas Statutes Annotated and amendments thereto. This is to allow the right of unitization of certain

Kansas

	commingled pressure communicated reservoir(s) within a common wellbore. It also allows the establishment of voluntary unitization operations when at least 90% of the working interest owners ratify in writing, establishing such unit operations without KCC application or order of approval.
URL	
Topic:	Venting/Flaring of Gas
Category	Laws and Regulation
Citation	Kan. Stat. Ann. § 55-102
Title	<i>Permitted</i>
Discussion	Venting and Flaring of Gas. This statute change allows venting or flaring of gas from natural gas wells (including gas from coal seams) when approved by the Kansas Corporation Commission. The venting or flaring of gas always has been associated with waste and, therefore, was not allowed except for associated casing head gas from oil wells.
URL	

Kentucky

Kentucky

Topic:	Data Access
Category	Resource
Citation	
Title	<i>Kentucky Geological Survey, University of Kentucky</i>
Discussion	The Kentucky Geological Survey has an electronic library of scanned plats, completion reports, logs, and plugging affidavits, and will soon have flowlines and gathering lines.
URL	
Topic:	Returning Idle Wells to Production
Category	Tax incentive
Citation	Ky. Rev. Stat. Ann. § 137.132
Title	<i>Credit for Production from Recovered Inactive Petroleum Wells</i>
Discussion	The statute gives producers a credit on the 4.5% severance tax imposed on production from oil wells that are brought back into production after having been inactive for two years, or plugged and abandoned.
URL	http://lrc.ky.gov/KRS/137-00/132.PDF
Topic:	Returning Idle Wells to Production
Category	Tax incentive
Citation	Ky. Rev. Stat. Ann. § 143A.033
Title	<i>Credit for Production from Recovered Inactive Natural Gas Wells</i>
Discussion	The statute gives producers a credit on the 4.5% severance tax imposed on production from natural gas wells that are brought back into production after having been inactive for two years, or plugged and abandoned.
URL	http://lrc.ky.gov/KRS/143A00/033.PDF
Topic:	Returning Idle Wells to Production

Kentucky

Category	Laws and Regulation
Citation	Ky. Rev. Stat. Ann. § 353.730
Title	<i>Investigation of Abandoned Wells -- Application -- Report -- Bond</i>
Discussion	This statute allows producers with a proper testing permit to test inactive wells for 60 days prior to posting bond for the well.
URL	http://lrc.ky.gov/KRS/353-00/730.PDF

Louisiana

Louisiana

Topic:	Carbon Capture, Geologic Storage, and Transportation (CCGST)
Category	Legislation
Citation	HB 661, Act 517
Title	<i>AN ACT to enact R.S. 19:2(12) and Chapter 11 of Title 30 of the Louisiana Revised Statutes of 1950, to be comprised of R.S. 30:1101 through 1111, relative to the storage of carbon dioxide; to provide for expropriation; to provide for the duties and powers of the commissioner of conservation; to provide for definitions; to provide for public hearings; to provide for enforcement; to provide for compliance orders; to provide for penalties; to provide for certificates of public convenience and necessity; to provide for certificates of completion; to provide for liability; to provide for the Geologic Storage Trust Fund; to provide for fees; to provide for uses of the fund; to provide for accounting and reports of the fund; to provide for site-specific trust accounts; and to provide for related matters.</i>
Discussion	The Louisiana Legislature passed this comprehensive bill in 2009 addressing the geologic storage of CO ₂ . A process for developing rules has not yet begun.
URL	http://www.legis.state.la.us/billdata/streamdocument.asp?did=668800
Topic:	Data Access
Category	Resource
Citation	
Title	<i>SONRIS and Interactive Haynesville Shale Mapping Site</i>
Discussion	Online production reporting, well database access (SONRIS), GIS Interactive Map system, and a wide variety and large quantity of information are available through the Office of Conservations Website. The Louisiana Haynesville Shale Website concerns hydraulic fracturing in the Haynesville Shale and offers interactive maps, GIS data download site, FAQs, and other pertinent information.
URL	http://dnr.louisiana.gov/haynesvilleshale/
Topic:	Deep Wells
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633

Louisiana

Title	<i>Rates of Tax</i>
Discussion	This statute reduces severance taxes on the following categories of wells to stimulate exploration and development of horizontal, new discovery, deep gas, or condensate wells. Severance taxes from gas or condensate produced from wells drilled to at least 15,000 feet are suspended from the date of first production for a period of 24 months, or until payout of well cost, whichever comes first. Payout of the well cost shall be determined by the DNR.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399
Topic:	Discovery Wells
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633
Title	<i>Rates of Tax</i>
Discussion	This statute reduces severance taxes on the following categories of wells to stimulate exploration and development: horizontal, new discovery, deep gas, or condensate wells. Severance taxes from certified new or discovery oil and natural gas wells are suspended from the date of first production for a period of 24 months, or until payout of well cost, whichever comes first. Payout of the well cost shall be determined by the DNR.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399
Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633.4
Title	<i>Rates of Tax</i>
Discussion	Tertiary Recovery. No severance tax shall be due on production from a qualified tertiary recovery project approved by the Secretary of the Department of Natural Resources until the project has reached payout. Payout is calculated from the total of production from investment costs; expenses particular to the tertiary project, not to include charges attributable to primary and secondary operations on that reservoir; and interest at commercial rates.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399

Louisiana

Topic:	Horizontal Drilling
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633
Title	<i>Rates of Tax</i>
Discussion	The statute reduces severance taxes on the following categories of wells to stimulate exploration and development of horizontal, new discovery, deep gas, or condensate wells. Severance taxes for oil or gas from horizontally drilled wells or recompletions are suspended from the date of first production for a period of 24 months (extended in 1996 Act 16 and in 1998 Act 7), or until payout of the well cost, whichever comes first. Payout of the well cost shall be determined by the Department of Natural Resources.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399
Topic:	Marginal Wells
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633
Title	<i>Rates of Tax</i>
Discussion	The statute reduces severance taxes on the following categories of wells to stimulate exploration and development of horizontal, new discovery, deep gas, or condensate wells. Stripper Oil Wells. Severance taxes on the following categories of wells were reduced to stimulate exploration and development: (1) Stripper Oil Wells and Incapable Oil Wells producing less than 10 barrels of oil per day are exempt from severance taxes during any month in which oil prices average less than \$20 per barrel. When oil prices are greater than \$20 per barrel, the severance tax is reduced by 7.5% to 3.125%. Wells producing more than 10 and less than 25 barrels of oil per day with at least a 50% saltwater cut are taxed at 6.25%, a 50% reduction. Marginal Gas Wells. Gas wells producing less than 250 Mcf per day are taxed at a reduced rate of \$0.013/Mcf.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399
Topic:	Offshore Production
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:305 (1)
Title	<i>Exclusions and Exemptions from the Tax</i>

Louisiana

Discussion	This statute provides exemptions from state and local sales and use taxes for repairs and/or materials used on drilling rigs and equipment used exclusively for exploration and development of minerals outside the territorial limits of the state in the Outer Continental Shelf.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399
Topic:	Orphaned and Abandoned Wells
Category	Laws and Regulation
Citation	La. Rev. Stat. Ann. § 30:80
Title	<i>Louisiana Oilfield Site Restoration Law</i>
Discussion	Act 404 of the 1993 Regular Session established the Oilfield Site Restoration (OSR) Law that includes an orphaned well plugging and site restoration fund. Fund oversight is provided by an OSR Commission. Revenue for the fund is generated from a fee on oil and gas production in the state, which is paid quarterly by Louisiana oil and gas operators. The imposed fee on production is in the amount of \$.015 per barrel of oil and condensate and \$.003 per Mcf of gas. Additionally, in accordance with the provisions of the OSR Law, when a transfer of ownership interest of an oilfield site occurs, either party of the transfer can elect to file an application to establish a site-specific trust account (SSTA) to cover future restoration costs. Doing this relieves the fee-generated portion of the fund from the financial burden of paying for restoration at the site covered by the SSTA in the event the site is orphaned. SSTA funds are not for general program use and are earmarked specifically to be used to restore the site to which they are dedicated. Once established, site-specific trust accounts remain with the site through subsequent property transfers.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=87691
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	
Title	<i>New Safety Rules Issued</i>
Discussion	In a January 12, 2009, press release, Louisiana Commissioner of Conservation James H. Welsh issued two new permanent rules and a new policy that combine to give Louisiana some of the most stringent oil and gas drilling safety rules in the country. The new permanent rules, which were effective as of Dec. 20, 2008, track the federal government's requirements on the drilling it regulates, and, as of January 12, a new office policy bans wells within 1,000 feet of the crossing of Interstate highways over major

Louisiana

	waterways. The 1,000-foot ban includes such areas as the I-10 crossing of the Sabine River, Calcasieu River, Atchafalaya Basin, Mississippi River, Lake Pontchartrain and Pearl River; the I-12 crossing of the Amite River; and the I-20 crossing of the Red, Ouachita, Tensas and Mississippi rivers, among others. Most oil and gas producing states have no rules addressing distance between oil and gas drilling operations and roadways, and the few that do require no more than a 100-foot distance. One of the rules places many new requirements on well operators to ensure the proper design, testing, and use of blowout preventers and diverters, as well as new requirements for the quick operation of valves controlling in-pipe gas and fluid flow. The rule also requires operators to ensure that employees of contracted drilling companies receive recurring training on well control practices and establish procedures to ensure employees retain the knowledge, skill, and competency to perform their well control duties. These safety rules were developed after extensive study by the Louisiana Department of Natural Resources' Office of Conservation and the Commissioner's Ad Hoc Committee on Drilling Safety. The committee included representatives from the state, the oil and gas industry, and landowner interests. http://dnr.louisiana.gov/cons/memos/memo20090112-well-location-policy-interstates.pdf
URL	http://dnr.louisiana.gov/cons/rules200812.pdf
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	Louisiana HB 159 - 2009 Regular Session (Act 126)
Title	<i>An act to amend and reenact R.S. 30:28(B), relative to drilling permits; to provide for the validity of drilling permits; and to provide for related matters.</i>
Discussion	Effective August 15, 2009, under Act 126 of the 2009 Regular Session, an operator can acquire a permit to drill with a one-year term (period of validity) as opposed to the traditional 180-day term. Both terms, the traditional 180-day permit and the one-year permit will be valid options. The associated fees for each category of the traditional 180-day permit will double for the one-year permit option.
URL	
Topic:	Water Management
Category	Tax incentive
Citation	La. Rev. Stat. Ann. § 47:633

Louisiana

Title	<i>Rates of Tax</i>
Discussion	Produced Water Injection. To help accomplish the objective of reducing the discharge of produced water and to help ease the financial burden placed on the oil and gas industry, it is the purpose of this section to provide an economic incentive to producers of oil and gas by allowing them to realize a severance tax savings (20% on incrementally produced oil and gas) if they inject produced water into an oil or gas reservoir for the purpose of increasing the recovery of hydrocarbons.
URL	http://www.legis.state.la.us/lss/lss.asp?doc=102399

Maryland

Maryland

Topic:	Coalbed Methane (CBM)
Category	Laws and Regulation
Citation	Environment Article 14 Section 112(a)(2)
Title	<i>Location of wells</i>
Discussion	This change allows for placement of coalbed methane wells at 500 feet from unleased property. The previous standard was 1,000 feet, and remains at that distance for all other wells.
URL	http://michie.lexisnexis.com/maryland/lpext.dll?f=templates&fn=main-h.htm&cp

Michigan

Michigan

Topic:	Data Access
Category	Resource
Citation	
Title	<i>West Michigan University Core Repository</i>
Discussion	The repository offers electronic submittal of hydrocarbon production reporting. Downloads and information can be found at the Office of Geological Survey.
URL	
Topic:	Marginal Wells
Category	Tax Incentive
Citation	1929 Mich. Pub. Acts 48
Title	<i>Marginal/Stripper Wells</i>
Discussion	Severance taxes are reduced from 6.6% to 4% for production from stripper oil wells. The severance tax rate for all gas production is 5 %. Stripper oil wells are defined by the state as wells with an average maximum daily production less than or equal to 10 barrels per day. Production from marginal oil properties receives the same reduction when average per well production is: 20 barrels or less for properties with average completion depths greater or equal to 2,000 feet but less than 4,000 feet; 25 barrels or less for properties with average completion depths greater or equal to 4,000 feet but less than 6,000 feet; 30 barrels or less for properties with average completion depths greater or equal to 6,000 feet, but less than 8,000 feet; 35 barrels or less for properties with average completion depths of at least 8,000 feet.
URL	http://legislature.mi.gov/doc.aspx?mcl-act-48-of-1929
Topic:	Spacing
Category	Tax incentive
Citation	1994 Mich. Pub Acts 451 Section 324.61513
Title	<i>Uniform Spacing Plan (U.S.P.) - Permit Exception to Spacing</i>
Discussion	

Michigan

URL	http://legislature.mi.gov/doc.aspx?mcl-324-61513
Topic:	Stranded Gas
Category	Laws and Regulation
Citation	Special Order No. 3-71, amended
Title	<i>No Flare Order</i>
Discussion	Mich. Comp. Laws § 324.61501 lays out the rules regulating waste of oil and gas in Michigan. Flaring of gas is allowed at specified volumes.
URL	http://www.michigan.gov/documents/deq/ogs-cause-1971-03-SO_266597_7.pdf
Topic:	Stranded Gas
Category	Laws and Regulation
Citation	Supervisor of Wells Order No. 18-2007
Title	
Discussion	Mich. Comp. Laws § 324.61501 lays out the rules regulating waste of oil and gas in Michigan. Flaring of gas is allowed at specified volumes.
URL	http://www.michigan.gov/documents/deq/ogs-oilandgas-spacing-albionscipio_258038_7.pdf
Topic:	Temporary Abandonment
Category	Laws and Regulation
Citation	Supervisor of Wells Instruction 1-2004
Title	<i>Conditions of Approval of Temporarily Abandoned Status for Oil and Gas Wells</i>
Discussion	Michigan Comp. Laws § 324.61501 lays out rules regulating waste of oil and gas in Michigan. Companies may temporarily abandon up to 10% of wells and greater an even greater percentage with supplemental bonding.
URL	http://www.michigan.gov/deq/0,1607,7-135-3311_4111_36974---,00.html

Mississippi

Mississippi

Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	Miss. Code Ann. § 27-25-503 (1)
Title	<i>Severance Taxes -- Privilege Tax Levied; Exemptions</i>
Discussion	The code reduces the assessed tax rate to 3% of the value of the oil produced by an enhanced oil recovery method in which carbon dioxide is used when transported by a pipeline to the oil well, has been expanded to include any other enhanced oil recovery method approved and permitted by the State Oil and Gas Board on or after April 1, 1994.
URL	http://michie.com/mississippi/lpext.dll?f=templates&fn=main-h.htm&cp=

Montana

Montana

Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	Mont. Code Ann. § 15-36-304 (1995)
Title	<i>Production Rates Imposed on Oil and Natural Gas - Exemption</i>
Discussion	Secondary/Tertiary Recovery. Production taxes are reduced for incremental production from secondary and tertiary recovery projects. Incremental secondary production is taxed at 8.5%. Incremental tertiary production is taxed at 5.8%. This incentive is suspended when the price of West Texas Intermediate crude oil exceeds \$30 per barrel for a calendar quarter and reactivates when the price of oil drops below \$30 per barrel.
URL	http://data.opi.mt.gov/bills/mca/15/36/15-36-304.htm
Topic:	Horizontal Drilling
Category	Tax incentive
Citation	Mont. Code Ann. § 15-36-304 (1995)
Title	<i>Production Rates Imposed on Oil and Natural Gas - Exemption</i>
Discussion	Horizontally Recompleted Wells. Horizontally recompleted oil wells pay a reduced production tax rate on the incremental production for the first 18 months of production after recompletion. This incentive is suspended when the price of West Texas Intermediate crude oil exceeds \$30 per barrel for a calendar quarter and reactivates when the price of oil drops below \$30 per barrel. Wells that have not produced for five years or more are treated, for tax purposes, as new wells (see also: Horizontal Wells section). Horizontal Wells. Production taxes for oil or gas wells that are completed horizontally or for horizontally recompleted oil wells that have not been producing for five years or more are exempt from production taxes, except for the 5% resource indemnity tax for the first 18 months of production.
URL	http://data.opi.mt.gov/bills/mca/15/36/15-36-304.htm
Topic:	Marginal Wells
Category	Tax Incentive
Citation	Mont. Code Ann. § 15-36-304 (1995)

Montana

Title	<i>Production Rates Imposed on Oil and Natural Gas - Exemption</i>
Discussion	Marginal/Mini Stripper Wells (three barrels per day or less). Oil from a well which produces three barrels per day or less is exempt from production taxes, except the 5% resource indemnity tax. A suspension clause eliminates this tax exemption when West Texas Intermediate crude oil prices reach \$38 per barrel for a calendar quarter and reactivates when the price drops below \$38 per barrel. Stripper oil wells are defined as those producing 15 barrels per day or less. Marginal/Stripper Wells (10 -15 barrels per day). The production tax rate on the first 10 barrels produced from a stripper oil well is 5.5%. The production tax rate is 9% on the next 10 to 15 barrels. Lower tax rates are provided for stripper well production when the price of West Texas Intermediate crude oil remains below \$30 per barrel in a calendar quarter. Montana defines a stripper oil well as a well that produces less than 15 barrels per day.
URL	http://data.opi.mt.gov/bills/mca/15/36/15-36-304.htm
Topic:	New production
Category	Tax incentive
Citation	Mont. Code Ann. § 15-36-304 (1995)
Title	<i>Production Rates Imposed on Oil and Natural Gas - Exemption</i>
Discussion	New Wells. Oil or gas production from new wells, or wells that have not produced for five years, are exempt from production taxes, except for the 5% resource indemnity tax, for the first 12 months of production.
URL	http://data.opi.mt.gov/bills/mca/15/36/15-36-304.htm
Topic:	Services
Category	Tax incentive
Citation	Mont. Code Ann. § 15-36-305 (1995)
Title	<i>Determination of Gross Value of Product</i>
Discussion	Crude oil or gas used by operators in connection with operations is tax exempt.
URL	http://data.opi.mt.gov/bills/mca/15/36/15-36-305.htm

Nebraska

Nebraska

Topic:	Data Access
Category	Resource
Citation	
Title	<i>Commission Website</i>
Discussion	The Nebraska Oil and Gas Conservation Commission offers an excellent array of data from its Website. Data include shape files of the state and surveyed subdivision in electronic format for use by anyone who uses various software packages to construct maps. Well data is supplied electronically, too, and includes API No., location, KB, log tops, operator, and status. The Commission also provides a LANDSAT study of Nebraska and northeastern Colorado that includes lineaments and prospect leads. These data were recently converted to vector files and will be provided after the next update. The Commission, while receiving production reports electronically from many operators, also accepts hard copy filings. Software is being developed to allow for the submission of Drilling Permits and Sundry Notices. Nebraska Geological Survey Information, samples, and cores may be accessed in Lincoln from the Nebraska Geological Survey
URL	
Topic:	Marginal Wells
Category	Tax Incentive
Citation	Neb. Rev. Stat. § 57-701
Title	<i>Terms, defined.</i>
Discussion	A severance tax reduction from 3% to 2% is available for oil wells that produce less than 10 barrels per day.
URL	http://uniweb.legislature.ne.gov/laws/search_range_statute.php?begin_section=57-701&end_section=57-719

Nevada

Nevada

Topic:	Data Access
Category	Resource
Citation	
Title	<i>Nevada Bureau of Mines and Geology (NBMG)</i>
Discussion	The Nevada Bureau of Mines and Geology (NBMG) is the research and public service unit of the University of Nevada and does state geological surveys. NBMG scientists conduct research and publish reports on mineral resources, engineering geology, environmental geology, hydrogeology, and geologic mapping.
URL	
Topic:	New production
Category	Tax incentive
Citation	Nev. Admin.Code § 522.150
Title	<i>Powers and Duties of Division</i>
Discussion	Reduced Administrative Fee for New Production. The amount of the administrative fee that a producer or purchaser of oil or natural gas must pay on new production pursuant to subsection 2 of Nevada Revised Statute 522.150 is one-half cent (five mills) per barrel of oil or per 50,000 cubic feet of natural gas, as appropriate. New production is defined as production from new wells or existing wells completed in new intervals as determined by the Commission on Mineral Resources. Any qualifying well will receive a reduced administrative fee for one full year. Upon completion of a qualifying well, the producer will submit a Form 5, "Well Completion Report." The production date as reported on the Form 5 will be the effective date for the reduced fee.
URL	http://search.leg.state.nv.us/isysquery/irl5136/1/doc
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	Nev. Admin.Code § 522.040
Title	<i>Permits to Drill Wells Required; Fees</i>
Discussion	See Nev. Admin.Code § 522.150

Nevada

URL	http://www.leg.state.nv.us/NRS/NRS-522.html#http://www.leg.state.nv.us/NRS/NRS-522.html#NRS522Sec040
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	Nev. Admin.Code § 522.050
Title	<i>Payment of Expenses for IOGCC; Administrative Fee</i>
Discussion	See Nev. Admin.Code § 522.150
URL	http://www.leg.state.nv.us/NRS/NRS-522.html#NRS522Sec050

New Mexico

New Mexico

Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	7-29A-2 NMSA 1978
Title	<i>Enhanced Oil Recovery Tax Incentive</i>
Discussion	Enhanced Oil Recovery Projects. The severance tax is reduced from 3.75% to 1.875% for oil produced from the date of positive production response. OCD approval is required. The incentive does not apply when the oil price is \$28 or more per barrel.
URL	
Topic:	Marginal Wells
Category	Tax Incentive
Citation	7-29B-1 NMSA 1978
Title	<i>Stripper Well Tax Incentive</i>
Discussion	Marginal/Stripper Wells. The incentive reduces both severance and emergency school taxes for stripper well properties having average daily production of less than 10 barrels or 60 Mcf per eligible well. Severance taxes are reduced from 3.75% to 1.875% or 2 13/16% and emergency school taxes are reduced from 4% to 2% or 3% for gas and from 3.15% to 1.58% or 2.36% for oil during periods of low prices (less than \$1.15 and between \$1.15 and \$1.35 per Mcf for gas and less than \$15 and between \$15 and \$18 per barrel for oil).
URL	
Topic:	Marginal Wells
Category	Laws and Regulation
Citation	N.M. Stat. Ann. § 19-10-5.1
Title	<i>Amendment of Lease to Lower Royalty Rate for Oil Wells Under Certain Conditions</i>
Discussion	State Royalty Reductions. A lower royalty rate (5%) applies to oil wells operated pursuant to a state oil and gas lease if the wells averaged: (i) less than 3 barrels per day for the preceding 12-month period but not more than 5 barrels per day for any month during that 12-month period if producing from shallower than 5,000 feet; and (ii) less than 6 barrels per day for the preceding 12-month period but not more than 10 barrels per day for any

New Mexico

	month during that 12-month period for production from 5,000 feet or deeper. Certain conditions apply and an application and fee are required.
URL	http://legis.state.nm.us/Sessions/99%20Regular/FinalVersions/house/HB0653.pdf
Topic:	Returning Idle Wells to Production
Category	Tax incentive
Citation	7-29B-1 NMSA 1978
Title	<i>Natural Gas and Crude Oil Production Incentive Act</i>
Discussion	Production Restoration Project. The Act exempts from severance tax (3.75%) wells that had fewer than 31 days of production in any period of 24 consecutive months after Jan. 1, 1993 that are brought back into production. The Act does not apply when the oil price is \$24 or more per barrel.
URL	
Topic:	Workovers
Category	Tax incentive
Citation	7-29B-1 NMSA 1978
Title	<i>Well Workover Project Tax Incentive</i>
Discussion	Well Workover Project. The incentive reduces severance taxes from 3.75% to 2.45% for oil and gas produced from wells having qualified workover operations performed. It does not apply when the price of oil is \$24 or more per barrel.
URL	

New York

New York

Topic:	Data Access
Category	Resource
Citation	
Title	<i>New York State Energy Research and Development Authority</i>
Discussion	The New York State Energy Research and Development Authority (NYSERDA) was created by the Legislature in 1975 as a public benefit corporation. One goal of NYSERDA's research and development program is to expand the use of indigenous and renewable energy resources. NYSERDA's natural gas agenda has evolved into a multifaceted research and development program structured around the following goals: to help develop new natural gas reserves through innovative exploration methods and reservoir studies; to enhance existing reservoir production by developing or demonstrating new technology and products; to increase natural gas storage from depleted natural gas fields and bedded salt; to improve industry environmental performance; and to conduct extensive industry outreach to educate firms on opportunities for economic production in New York State. Additionally, NYSERDA funds carbon sequestration research.
URL	http://www.nyserda.org/default.asp

North Dakota

North Dakota

Topic:	Carbon Capture, Geologic Storage, and Transportation (CCGST)
Category	Legislation
Citation	Senate Bill 2095
Title	<i>AN ACT to create and enact chapter 38-22 of the North Dakota Century Code, relating to the geologic storage of carbon dioxide; to repeal section 38-08-24 of the North Dakota Century Code, relating to priorities in permitting carbon dioxide geologic storage projects; to provide a penalty; and to provide a continuing appropriation.</i>
Discussion	At the request of the North Dakota Industrial Commission a task force drafted legislation covering the geologic storage of carbon dioxide. The task force was made up of representatives of coal mining, electric generation and transmission, their association, oil and natural gas, their association, the state health department, state mineral resources department and the office of the attorney general. In advance of the 2009 legislative session, the Industrial Commission pre-filed the two bills created by the task force, one covering geologic storage, SB 2095, and the other covering core space, SB 2139. Both were passed by the North Dakota Legislature and signed into law by Governor John Hoeven on April 8, 2009.
URL	http://www.legis.nd.gov/assembly/61-2009/bill-text/JQTA0300.pdf
Topic:	Carbon Capture, Geologic Storage, and Transportation (CCGST)
Category	Legislation
Citation	Senate Bill 2139
Title	<i>A BILL for an Act to create and enact a new chapter to title 47 of the North Dakota Century Code, relating to ownership of subsurface pore space; to provide for application; and to declare an emergency.</i>
Discussion	See Senate Bill 2095
URL	http://www.legis.nd.gov/assembly/61-2009/bill-text/JQTB0300.pdf
Topic:	Data Access
Category	Resource
Citation	

North Dakota

Title	<i>Commission Website</i>
Discussion	North Dakota provides access to the public via the oil and gas division Website for well files and well data, cores, logs, production and injection volumes, field orders and case files, and streaming audio of cases as they are being held. Witnesses are allowed to provide telephonic testimony at the time the cases are being heard. North Dakota provides electronic submittal of production and injection volumes, permits to drill, and spill reporting.
URL	https://www.dmr.nd.gov/oilgas/
Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-05.1
Title	<i>Tax Incentives for Qualifying Secondary Recovery Projects</i>
Discussion	Incremental oil from secondary recovery projects is exempt from extraction taxes for five years, and incremental oil from tertiary projects is exempt for 10 years from the date incremental production commences. All oil from a qualifying secondary or tertiary recovery project is taxed at a reduced rate of 4% once the five- or ten-year exemption has expired. Non-incremental oil from a qualifying secondary recovery project, when its average production level has increased to at least 25% over normal operations for six months, is taxed at a reduced rate of 4%.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-05.2
Title	<i>Tax Incentives for Qualifying Tertiary Recovery Projects</i>
Discussion	Non-incremental oil from a qualifying tertiary recovery project that produces at least 15% above normal operations for one month and continues to operate as a qualified project is taxed at a reduced rate of 4%.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
Topic:	Horizontal Drilling

North Dakota

Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-06
Title	<i>New Well Exemption for Horizontal Wells</i>
Discussion	Horizontal Wells. Production from new horizontal wells drilled and completed after April 27, 1987, but before April 1, 1995, is exempt from extraction taxes for the first 15 months following well completion, and is then taxed at a rate of 4% thereafter. Oil produced from a horizontal well drilled and completed after March 31, 1995, is exempt for the first 24 months. Affected by price trigger. The NDPC attributes significant increases of drilling activity to this incentive, plus new technology, new finds and good oil prices. The NDIC's statistics show an increase in permits and a decline in the rate of well plugging. As an unexpected benefit, while pursuing new horizontal plays, new plays and new fields have been discovered.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
Topic:	Horizontal Drilling
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-10
Title	<i>Horizontal Re-entry Well Exemption</i>
Discussion	Horizontal Re-entry Well Exemption. Oil produced from a horizontal re-entry well during the first nine consecutive months starting with the date the well was re-completed as a horizontal well is exempt from the oil extraction tax. The designation of a horizontal re-entry well is given to a well initially drilled and completed as a vertical well which is re-entered and re-completed as a horizontal well after March 31, 1995. This designation may also apply to the re-entry and recompletion of a vertical well that is classified by the NDIC as a dry hole. Affected by price trigger.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
Topic:	Horizontal Drilling
Category	Tax incentive
Citation	N.D. Cent. Code § 57-51-1.3
Title	<i>Horizontal Well</i>
Discussion	Horizontal Well. The first 75,000 barrels of oil produced during the first 18 months after completion, or \$4.5 million gross value of oil produced, from a horizontal well drilled and completed is subject to a reduced tax rate of 2% of the gross value at the well of the oil

North Dakota

	extracted. Affected by price trigger.
URL	http://www.legis.nd.gov/cencode/t57c511.pdf
Topic:	Marginal Wells
Category	Tax Incentive
Citation	N.D. Admin. Code § 81-09-03-07
Title	<i>Stripper Well Exemption</i>
Discussion	Stripper Well Property Determination (No Trigger). This section outlines the requirements for an operator desiring to classify a property as a stripper well property for the purposes of exempting production from extraction taxes. Oil produced by stripper wells is exempt from extraction taxes. Stripper wells are defined as wells with an average daily production during a 12-month consecutive qualifying period of up to 10 barrels per day at a depth of less than 6,000 feet; up to 15 barrels per day at a depth of 6,000 to 10,000 feet; and up to 30 barrels per day at depths greater than 10,000 feet. Stripper wells must be certified by the NDIC. This section was amended in May 2004 to offer operators the opportunity to reclassify already determined single well stripper properties as another type of property.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
Topic:	New production
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-06
Title	<i>New Wells</i>
Discussion	New Wells. Production from new wells drilled and completed after April 27, 1987, is exempt from extraction taxes for the first 15 months of production and taxed at a rate of 4% thereafter (reduced from 6.5%). Affected by price trigger.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
Topic:	New production
Category	Tax incentive
Citation	N.D. Cent. Code § 57-51.1-03
Title	<i>Exemptions from Oil Extraction Tax</i>

North Dakota

Discussion	Tribal Lands Oil Tax Exemption (No Trigger). Initial production of oil from a well is exempt from extraction tax (6.5%) for 60 months if: the well is located on a reservation; or the well is located on trust land held for a tribe; or the land is held by a tribe at the time this Act was passed.
URL	http://www.legis.nd.gov/cencode/t57c511.pdf
Topic:	New production
Category	Tax incentive
Citation	N.D. Cent. Code § 57-51-02.4
Title	<i>Shallow Gas - Gross Production Tax Exemption</i>
Discussion	Shallow Gas Wells (No Trigger). Shallow gas from new or re-completed wells drilled and completed after June 30, 2003, is exempt from gross production taxes for the first 24 months of gas sales.
URL	http://www.legis.nd.gov/cencode/t57c51.pdf
Topic:	On-site Use of Produced Oil/Gas
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-02-16
Title	<i>Exemption for Lease Use Gas</i>
Discussion	Services (No Trigger). Natural gas used on-site in the production of oil or gas is exempt from production taxes.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-02.pdf
Topic:	On-site Use of Produced Oil/Gas
Category	Tax incentive
Citation	N.D. Cent. Code § 38-08-06.4
Title	<i>Commission Shall Determine Market Demand and Regulate the Amount of Production</i>
Discussion	Stranded Gas Usage. Gas burned at the well site to power an electrical generator that consumes at least 75% of the gas from the well is exempt from the gross production tax.

North Dakota

URL	http://www.legis.nd.gov/cencode/t38c08.pdf
Topic:	Returning Idle Wells to Production
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-11
Title	<i>Two-year Inactive Well Exemption</i>
Discussion	Idle Wells. Production from oil wells that have been inactive for at least two years and are returned to production is exempt from extraction taxes for 10 years, beginning the first day of the month in which NDIC certification is received by the Tax Commissioner. Affected by price trigger.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf#http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf
Topic:	Temporary Abandonment
Category	Laws and Regulation
Citation	N.D. Admin. Code § 43-02-03-55
Title	<i>Abandonment of Wells -- Suspension of Drilling</i>
Discussion	Temporary Abandonment of Wells, Suspension of Drilling. This rule defines what constitutes abandonment of a well. The rule also dictates how soon after abandonment a well is to be plugged and the drill site reclaimed. By giving the well temporarily abandoned status, the NDIC director may waive this requirement for one year. The director may extend a well's temporarily abandoned status annually. The director also may approve suspension of the drilling of a well. If suspension is approved, a plug must be placed at the top of the casing. Unless authorized by the director, a well must be plugged and its site reclaimed if drilling has been suspended for 30 days. The goal is to prevent the permanent plugging of wells due to low oil prices.
URL	http://www.legis.nd.gov/information/acdata/pdf/43-02-03.pdf
Topic:	Unitization
Category	Laws and Regulation
Citation	N.D. Cent. Code § 38-08-09.5
Title	<i>Ratification or Approval of Plan by Lessees and Owners</i>

North Dakota

Discussion	Statutory Unit Ratification. The statute lowers from 70% to 60% the percentage approval of working interests and mineral owners required to form an oil production unit. The NDIC and the NDPC are monitoring the effectiveness of this incentive.
URL	http://www.legis.nd.gov/cencode/t38c08.pd
Topic:	Venting/Flaring of Gas
Category	Tax incentive
Citation	N.D. Cent. Code § 38-08-06.4
Title	<i>Flaring of Gas Restricted - Imposition of Tax - Payment of Royalties -Industrial Commission Authority</i>
Discussion	Flared Gas. Gas produced with crude oil from an oil well may be flared during a one-year period from the date of first production from the well without paying royalties and taxes. A producer may obtain an exemption to the one-year period after showing that connection of the well to a natural gas gathering line is economically infeasible or that a market for the gas is not available and that equipping the well with an electrical generator to produce electricity from gas is not economically feasible.
URL	http://www.legis.nd.gov/cencode/t38c08.pdf
Topic:	Workovers
Category	Tax incentive
Citation	N.D. Admin. Code § 81-09-03-08
Title	<i>Workover Exemption</i>
Discussion	Workover Project Determination. Applicants have the burden of establishing entitlement to the exemption provided in NDCC § 57-51.1-03 and upon completion of the workover project shall submit all information necessary for a determination by the director. Production resulting from qualifying workover projects is exempt from extraction taxes for 12 months, beginning the third month after completion of the workover project, and is taxed at 4% thereafter. Wells that have produced less than 50 BOPD during the last six months of continuous production before workover qualify for this exemption. The operator must notify the NDIC before beginning the project. The project must cost at least \$65,000, or production must increase 50% or more in the first two months after project completion. Affected by price trigger.
URL	http://www.legis.nd.gov/information/acdata/pdf/81-09-03.pdf

Ohio

Topic:	Data Access
Category	Resource
Citation	
Title	<i>Ohio Oil and Gas Energy Education Program</i>
Discussion	With the passage of Substitute Senate Bill 46 in December 1997, and the approval of independent producers and royalty owners in a required referendum held in March 1998, the Ohio Oil and Gas Energy Education Program (OOGEEP) became effective on April 1, 1998. OOGEEP is a nonprofit organization and is funded entirely by independent producers and royalty owners through an assessment on the production of all crude oil and natural gas in Ohio. The assessment on crude oil is equal to one cent (\$0.01) per gross barrel and one-tenth of one cent (\$0.001) per gross thousand cubic feet of natural gas. All first purchasers of crude oil and natural gas are required to collect the assessment and submit quarterly payments directly to OOGEEP. The OOGEEP Operating Board consists of six independent producers and one member representing a farmer's organization. As outlined in the Ohio Revised Code, they are appointed by the Ohio Department of Natural Resources, Division of Minerals Resources Management's Technical Advisory Council based upon recommendations from a qualified producers organization and an organization representing farmers, such as the Ohio Oil and Gas Association and the Ohio Farm Bureau.
URL	
Topic:	Data Access
Category	Resource
Citation	Ohio Admin. Code 3750
Title	<i>Ohio State Response Commission: Emergency and Hazardous Chemical Inventory Form</i>
Discussion	In lieu of Ohio oil and gas well owners filing hazardous chemical inventory forms under the Community Right to Know Act SARA title III, the well owners can file well completion and annual production statements with the Division of Mineral Resources Management (DMRM). The well completion and annual statement of production forms were amended to include the number of storage tanks associated with the well and the storage capacity of those tanks. This information, along with detailed well information, can be found on the Division's Website (http://www.Ohiodnr.com/mineral/index.html). Additionally, a link is provided in DMRM's Website to the "Oil and Gas Well Emergency Response System" that was developed with U.S. Department of Energy funding through the Argonne National Lab. This site provides emergency responders with well owner contact phone numbers,

	emergency officials' phone numbers and site specific information on a well by well basis.
URL	http://codes.ohio.gov/oac/3750
Topic:	Hydraulic fracturing
Category	Laws and Regulation
Citation	Ohio Admin. Code 3750
Title	<i>State Emergency Response Commission</i>
Discussion	Emergency and Hazardous Chemical Inventory Form. In lieu of Ohio oil/gas well owners filing hazardous chemical inventory forms under the Community Right to Know Act SARA title III, the well owners will be deemed to have complied by virtue of having filed well completion and annual production statements with the Division of Mineral Resources Management (DMRM). The well completion and annual statement of production forms were amended to include the number of storage tanks associated with the well and the storage capacity of those tanks. This information along with detailed well information can be found on the Division's Web site (http://www.Ohiodnr.com/mineral/index.html). Additionally, a link is provided in DMRM's Web site to the "Oil and Gas Well Emergency Response System" that was developed with U.S. Department of Energy (DOE) funding through the Argonne National Lab. This site provides emergency responders with well owner contact phone numbers, emergency officials phone numbers and site specific information on a well by well basis.
URL	http://codes.ohio.gov/oac/3750
Topic:	Orphaned and Abandoned Wells
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann. § 1509.071
Title	<i>Forfeiture of bond; oil and gas well fund; proceedings for forfeiture of appurtenant equipment to state; landowner may apply to plug well; transfer of ownership</i>
Discussion	A landowner grant program has been established for the plugging of orphaned wells. Between \$300,000 and \$500,000 per year will be set aside to fund this program. Eligible landowners can plug the orphaned wells on their land sooner and have more control in the plugging process than in the state's traditional bid process. The landowners must receive bids from contractors for a plugging plan that complies with state regulations and must submit an application to the Division of Mineral Resources Management. If approved, the landowner will be reimbursed for the cost of plugging.

URL	http://codes.ohio.gov/orc/1509.071
Topic:	Orphaned and Abandoned Wells
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann. § 1509.071
Title	<i>Forfeiting Bond</i>
Discussion	This law permits the Division of Mineral Resources Management to transfer to landowners or their agents for production, a well eligible for plugging under this program if Ohio's well ownership requirements are met. Wells previously abandoned will become property of the state. Landowners or registered well owners can take over the well for production.
URL	http://codes.ohio.gov/orc/1509.071
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann § 1509.03
Title	<i>Administrative Rules</i>
Discussion	See Ohio Rev. Code Ann. §1509.02
URL	http://codes.ohio.gov/orc/1509.02#http://codes.ohio.gov/orc/1509.03
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann § 1509.06
Title	<i>Application for Permit to Drill, Reopen, Convert, or Plug Back a Well</i>
Discussion	See Ohio Rev. Code Ann. §1509.02
URL	http://codes.ohio.gov/orc/1509.03
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann § 1509.23

Title	<i>Health and Safety Rules for Drilling of Wells and Production of Oil and Gas</i>
Discussion	See Ohio Rev. Code Ann. §1509.02
URL	http://codes.ohio.gov/orc/1509.23
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann § 1509.31
Title	<i>Notice to Holder of Royalty Interest of Assignment or Transfer of Entire Interest in Lease</i>
Discussion	See Ohio Rev. Code Ann. §1509.02
URL	http://codes.ohio.gov/orc/1509.31
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	Ohio Rev. Code Ann. § 1509.02
Title	<i>Division of mineral resources management</i>
Discussion	Division of Mineral Resources Management. Under House bills 278 and 279, Ohio Revised Code Sections 1509.02, 1509.03, 1509.06, 1509.23 and 1509.31 were amended and 1509.39 was repealed. The amendments and repeal provided for the Division of Mineral Resources Management to be the sole and exclusive authority to regulate the permitting, location, and spacing of oil and gas wells in Ohio. The House bills created the Oil and Gas Advisory Council, which advised the chief on rules drafted pursuant to the enactment of the bills. Public hearings were held on the draft rules in June and July of 2005 with the effective date of the rules in August 2005. The rules provide more authority for the chief in the areas of safety during the drilling and production of oil and gas wells, protection of groundwater resources and environmental protection for wells drilled in “urbanized areas” (all municipal corporations and any township with an unincorporated population exceeding 5,000).
URL	http://codes.ohio.gov/orc/1509.02

Oklahoma

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Topic:	Carbon Capture, Geologic Storage, and Transportation (CCGST)
Category	Resource
Citation	
Title	<i>Oklahoma Carbon Sequestration Verification Program</i>
Discussion	The Oklahoma Conservation Commission has developed a model program designed to help residents take advantage of opportunities created by existing carbon markets. The program is a fee-based service provided to participating aggregators who contract with agriculture producers and forest landowners to sell their offsets. It is also offered to Oklahoma companies injecting CO2 underground. Verification adds a layer of assurance that buyers of CO2 offsets are getting what they pay for. By developing a program that combines research, natural resource protection, and state-backed verification of carbon offsets, Oklahoma is maximizing the quality of offsets from agriculture, forestry, and geologic sequestration.
URL	
Topic:	Carbon Capture, Geologic Storage, and Transportation (CCGST)
Category	Legislation
Citation	Senate Bill 1765
Title	<i>An Act relating to geologic storage of carbon dioxide; stating legislative findings; creating the Oklahoma Geologic Storage of Carbon Dioxide Task Force; stating membership; providing for staffing; requiring appointments by certain date; providing for travel reimbursement; requiring report by certain date; providing for termination of task force; providing for noncodification; and declaring an emergency.</i>
Discussion	Senate Bill 1765 established the Oklahoma Geologic Storage of Carbon Dioxide Task Force with a mandate to submit a report with legislative recommendations by December 1, 2008. Legislation was passed in 2009 that addressed the division of jurisdiction over CO2 capture and storage. In March 2009, the Oklahoma Conservation Commission adopted permanent rules that provide a mechanism for the verification of the sequestration of carbon dioxide, both terrestrial and geologic.
URL	http://webserver1.lsb.state.ok.us/2007-08bills/SB/sb1765_enr.rtf

Oklahoma

Topic:	Data Access
Category	Resource
Citation	
Title	<i>Well Inspection Project</i>
Discussion	The Field Operations Department set a goal three years ago to physically inspect every well in Oklahoma within five years. The estimate at that time was approximately 130,000 wells, which appears to have been too low. As of July 1, 2009, Field Operations had inspected 93,605 wells and, according to records, there are 190,440 left to inspect. However, the department believes that number to be erroneous because records haven't been updated in a timely fashion. In many cases, no well was found at the location because it had been plugged years ago but not entered into the database. As each well is inspected, the GPS reading, well status and type are entered into a spreadsheet which is stored on a portable hard drive for later use in updating the database. It has been determined that many wells had been entered multiple times, causing the database to be incorrect.
URL	
Topic:	Data Access
Category	Resource
Citation	
Title	<i>Oklahoma Small Business Linked Deposit Program</i>
Discussion	Operated through the Oklahoma Treasury Department, the program provides low-interest loans to qualifying businesses, including oil-related businesses. Loans can be used for production enhancements, workovers, and other activities that increase compliance, efficiencies and protect the environment.
URL	
Topic:	Deep Wells
Category	Tax incentive
Citation	Okla. Stat. tit. 68, § 1001(I)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Deep Wells. For purposes of qualifying for the exemption, "depth" means the length of a maximum continuous string of drill pipe utilized between the drill bit face and the drilling rig's kelly bushing. Deep wells spudded between July 1, 1994, and June 30, 1997, and

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	drilled to a depth of 15,000 feet or greater shall be exempt from the gross production tax beginning with the date of first sale for a period of 28 months. Deep wells spudded between July 1, 1997, and June 30, 2002, and drilled to a total depth of 12,500 feet or greater shall be exempt from the gross production tax for a period of twenty-eight (28) months beginning with the date of first sale. Deep wells spudded between July 1, 2002, and June 30, 2009, and drilled between a depth of 12,500 feet and 14,999 feet shall be exempt from the gross production tax for a period of 28 months beginning with the date of first sale. Deep wells spudded between July 1, 2002, and June 30, 2011, and drilled between a depth of 15,000 feet and 17,499 feet shall be exempt from the gross production tax for a period of 48 months beginning with the date of first sale. Deep wells spudded between July 1, 2002, and June 30, 2011, and drilled to a total depth of 17,500 feet or greater shall be exempt from the gross production tax for a period of 60 months beginning with the date of first sale. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
Topic:	Discovery Wells
Category	Tax incentive
Citation	Okla. Stat. tit. 68, § 1001(I)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	New Discovery Wells. New Discovery is defined as production of oil, natural gas, or oil and natural gas from: (a) A well, spudded or re-entered prior to July 1, 1997, which discovers crude oil in paying quantities, and is located more than one mile from the nearest oil well producing from the same interval. (b) A well, spudded or re-entered on or after July 1, 1997, and prior to July 1, 2009, which discovers crude oil in paying quantities, and is located more than one mile from the nearest oil well producing from the same interval of the same formation. (c) A well, spudded or re-entered prior to July 1, 1997, which discovers crude oil in paying quantities beneath current production in a deeper producing formation, located more than one mile from the nearest oil well producing from the same deeper interval. (d) A well, spudded or re-entered on or after July 1, 1997, and prior to July 1, 2009, which discovers crude oil in paying quantities beneath current production in a deeper producing interval, located more than one mile from the nearest oil well producing from the same interval of the same formation. (e) A well, spudded or re-entered prior to July 1, 1997, which discovers natural gas in paying quantities, and is located more than two miles from the nearest natural gas well producing from the same interval. (f) A well, spudded or re-entered on or after July 1, 1997, and prior to July 1, 2009, which discovers natural gas in paying quantities, and is located more than two miles from the nearest natural gas well producing from the same interval. (g) A well, spudded or re-entered prior to July 1, 1997, which discovers natural gas in paying quantities beneath current production in a deeper producing interval, that is located more than two miles from the nearest natural gas well producing from the same deeper interval. (h) A well, spudded or

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	re-entered on or after July 1, 1997, and prior to July 1, 2009, which discovers natural gas in paying quantities beneath current production in a deeper producing interval, that is located more than two miles from the nearest natural gas well producing from the same deeper interval. Qualified new discovery wells shall be exempt for a period of 28 months from the date of first sales. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001(D)(3)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Tax Exemption for Secondary Recovery Projects. The incremental production from approved secondary recovery properties approved or having an initial beginning date on or after July 1, 2000, and prior to July 1, 2009, is exempt from gross production tax for a period of five years or ending upon termination of the secondary recovery process. The operator is not required to submit capital expenses or project costs. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001(D)(4)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Tax Exemption for Tertiary Recovery. The incremental production from approved tertiary recovery projects begun on or after July 1, 1988, and before July 1, 2009, is exempt from the gross production tax for a period of 10 years or expires upon project payback, whichever comes first. Project payback provides for recovery of capital and operating expenses. Administration expenses and capital expenses of pipelines built to transport carbon dioxide to a project are excluded. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf

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Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	Okla. Stat. Tit.68, § 1357 (32)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Sales Tax Exemption for Electricity Sold for Operation of Enhanced Recovery Methods on a Spacing Unit or Lease. Electricity used for operation of enhanced recovery methods to produce oil is exempt from the sales tax beginning July 1, 2006.
URL	
Topic:	Horizontal Drilling
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001(E)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Horizontally Drilled Wells. Wells qualifying for this rebate must be drilled in a manner that encounters and subsequently produces from a geological formation at an angle in excess of seventy (70) degrees from the vertical and which laterally penetrates a minimum of one hundred and fifty (150) feet into the pay zone of the formation. For wells producing after July 1, 1994, and prior to July 1, 2002, the rebate shall be 24 months or ending upon payback. For wells producing after July 1, 2002, and prior to July 1, 2009, the rebate shall be 48 months or ending upon payback. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
Topic:	Increasing Production
Category	
Citation	Okla. Stat. Ann. tit. 68, § 1001(B)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Reduction in the State's Gross Production Tax on Oil. The gross production tax rate levied on oil was changed from a rate of 7% to a variable rate of either 7%, 4% or 1%. Effective with the January 1999 production month, the gross production tax rate on oil is as follows: If the average price of Oklahoma oil as determined by the Tax Commission equals or exceeds seventeen dollars (\$17.00) per barrel, the tax shall be levied at seven percent (7%). If the average price of Oklahoma oil as determined by the Tax Commission is less

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	than seventeen dollars (\$17.00) but equal to or exceeds fourteen dollars (\$14.00) per barrel, the tax shall be levied at four percent (4%). If the average price of Oklahoma oil as determined by the Tax Commission is less than fourteen dollars (\$14.00) per barrel, the tax shall be levied at one percent (1%). The average price as computed by the Oklahoma Tax Commission for both oil and natural gas shall be used to determine the applicable tax rate for the third month following production. The new version of this law extends the sunset from July 1, 2009 to July 1, 2012
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
Topic:	Marginal Wells
Category	Tax Incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001.3a (2008)
Title	<i>Economically At-risk Oil or Gas Leases - Tax Exemptions</i>
Discussion	Economically At-Risk Oil Leases. Operators may apply to the Oklahoma Tax Commission for a rebate of 6/7ths of the gross production tax upon demonstrating that they operate a lease that is economically at-risk. This particular rebate was previously in effect for calendar years 1997 and 1998 wherein it applied only to at-risk oil leases. Effective July 1, 2005, Oklahoma statutes were amended wherein the rebate applies to both at-risk oil and gas leases. The definition of an economically at-risk lease means any lease operated at a net profit or a net loss, which is less than the gross production tax remitted for such lease in a given calendar year. Operators of at-risk leases shall make application to the Tax Commission to certify that they meet the criteria for being at-risk. Upon approval by the Commission, operators shall file a claim for refund of 6/7ths of the 7% gross production tax remitted for the qualifying year. The at-risk rebate is applicable to calendar years 1997, 1998, 2005, 2006 and 2007. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
Topic:	New Technology Usage
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001(J)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Three-Dimensional Seismic Technology. Operators producing oil, natural gas, or oil and natural gas from a well, the drilling of which is commenced after July 1, 2000, and prior to July 1, 2009, located within the boundaries of a three-dimensional seismic shoot and drilled based upon three-dimensional seismic technology, may apply to the Tax

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	Commission for a rebate of gross production tax paid in the previous fiscal year upon qualifying such well with the Oklahoma Corporation Commission. Qualified projects shall be exempt for a period of 18 months from the date of first sale for seismic shot prior to July 1, 2000. Projects shot after July 1, 2000, and prior to July 1, 2009, shall be exempt for a period of 28 months from the date of first sale. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
Topic:	Orphaned and Abandoned Wells
Category	Resource
Citation	
Title	<i>Brownfields Restoration Program</i>
Discussion	Years ago an oil and gas company or gasoline station owner sometimes went bankrupt or simply abandoned a property without removing equipment, tanks, or pollution left behind and/or properly plugging oil and gas wells. This left no one responsible for cleaning up any remaining problems, including pollution, making it difficult to re-use or develop a property. The Oklahoma Corporation Commission has a Brownfields program to help people and companies deal with these old, potentially polluted sites. The state provides information and guidance, some free services, and helps them access various programs. At the end of the process, the new owner/operator can be granted a state and federal liability release. The program can: (1) Determine eligibility; (2) Conduct some limited assessment work at a potentially polluted oil/gas site, at no cost to the eligible owner/operator, to determine if the property is likely polluted or not; (3) Provide complete no-cost assessments and sometimes a portion of the cleanup costs if a government, church, or non-profit is seeking to buy or use the property; (4) Refer an abandoned polluted and/or junk-filled oilfield site to the OERB for a fully funded (no cost) cleanup; (5) Help owners/operators access the state plugging fund for abandoned oil and gas wells found on the property, at no cost; (6) Help prospective purchasers access the Commission's Petroleum Storage Tank Indemnity Fund, which after a small deductible (often waived for cities and non-profits) will pay to assess and clean up the property at no additional cost; (7) Refer owners to the Commission group that can investigate the source of unknown gas fumes in buildings, and help with curing the problem; and (8) Keep eligible site owners/operators informed about periodic federal Brownfields grants, up to \$200,000 per site to pay for additional assessment work and to clean up the property, that can be applied for. Sites that go through the Brownfields program have a State and Federal liability release.
URL	

Oklahoma

Topic:	Orphaned and Abandoned Wells
Category	Tax incentive
Citation	Okla. Stat. tit. 68, § 1001(F)
Title	<i>Property Exempt from Taxation</i>
Discussion	The statute exempts wells on which work to re-establish production commenced on or after July 1, 1994, and on or before June 30, 1997, that have not produced oil, natural gas, or oil and natural gas for a period of not less than two years, as evidenced by the appropriate forms on file with the Oklahoma Corporation Commission reflecting the well's status. Also exempt are wells on which work to re-establish production commenced on or after July 1, 1997, and on or before June 30, 2009, that have not produced oil, natural gas, or oil and natural gas for a period of not less than one year, as evidenced by the appropriate forms on file with the Oklahoma Corporation Commission reflecting the well's status. Exemption is also granted to any well which, after July 1, 1997, experiences mechanical failure or loss of mechanical integrity, as defined by the Corporation Commission, including but not limited to, casing leaks, collapse of casing, loss of equipment in a wellbore or any similar event which causes cessation of production and results in a workover of the well, as evidenced by the use of a workover rig or other mechanical device being placed over the well to repair the well or equipment. Qualified wells are exempt for a period of 28 months from the date production was re-established. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf#http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
Topic:	Resource Management
Category	Laws and Regulation
Citation	Okla. Admin. Code § 165:10-712
Title	<i>Procedures for the Seeping Natural Gas Program</i>
Discussion	Seeping Natural Gas was put in the rule book effective July 1, 2007.
URL	
Topic:	Shale Gas
Category	Laws and Regulation
Citation	Okla. Admin. Code § 165:10-17
Title	<i>Well Tests</i>

Oklahoma

Discussion	Upon written request, the rulemaking provided for more time to perform the state test than the 30-day period specified in the rule. This change was implemented primarily to accommodate the longer time required to recover frac fluids and "fines" created in certain stimulation techniques used in the completion of Woodford Shale gas wells. Shutting in the well too early to perform the state test posed a higher risk of damaging the well or even losing it.
URL	
Topic:	Water Management
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1357 (2008)
Title	<i>Exemptions - General</i>
Discussion	Sales Tax Exemption for Electricity and Associated Delivery and Transmission Services Sold for Operating of Reservoir Dewatering Project and/or Unit. The increased use of dewatering methods in certain carbonate and shale reservoirs in Oklahoma, which typically have a high water cut during the initial phase of hydrocarbon production, stimulated interest in providing a tax incentive to encourage the use of such technology. Reservoir dewatering projects have substantial costs associated with electricity and associated delivery and transmission services caused by the use of high capacity downhole pumps to accelerate the removal of formation water. Likewise, there is added electricity expense caused by operation of large capacity disposal wells configured to receive the high volume of produced water. Once the water is removed at accelerated rates, oil and gas production, which otherwise would be uneconomical under traditional production methods, has often increased substantially. Also, increased development of natural gas from coal seams in eastern Oklahoma, which involves the dewatering of the coal seam to enhance gas production, spurred interest in this incentive. In some areas of the state, electricity sold by public utilities with certified service territories, is subject to state sales tax. To encourage oil and gas development in such areas, the Oklahoma Legislature enacted S.B. 871 (2002) to provide for the Oklahoma Corporation Commission to classify areas and reservoirs as "reservoir dewatering projects" and/or "reservoir watering units," wherein the statutory criteria of an initial water to oil ratio greater than or equal to five to one (5 to 1) is proved to exist. The regulations implementing S.B. 871 provided for a conversion factor to calculate a water to gas ratio to equate to the 5 to 1 water to oil ratio. Once classified as a "reservoir dewatering project," request is made to the Oklahoma Tax Commission for a sales tax exemption letter, which the operator uses in its relationship with the electricity supplier to gain an exemption of the state sales tax otherwise charged for sales of electricity and associated delivery and transmission services for operation of the project. The goals of the incentive are (1) to increase the use of reservoir dewatering technology associated with the drilling, exploration, and production of hydrocarbon resources from

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	certain carbonate, shale, and coal seam reservoirs in the state; and (2) to provide a state tax incentive for such drilling, exploration and production enterprises through a reduction of the state's sales tax burden on the sale of electricity and associated delivery and transmission services, which are an inherently high expense for reservoir dewatering operations.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf
Topic:	Workovers
Category	Tax incentive
Citation	Okla. Stat. Ann. tit. 68, § 1001(G)
Title	<i>Gross Production Tax on Asphalt, Ores, Oil and Gas, and Royalty Interests - Exemptions</i>
Discussion	Production Enhancements – Recompletions. A rebate of the gross production tax may apply to the following: (A) For production enhancement projects having a project beginning date prior to July 1, 1997, any downhole operation in an existing oil well or natural gas well that is conducted to establish production of oil or natural gas from any geological interval not currently completed or producing in such existing oil or natural gas well. (B) For production enhancement projects having a project beginning date on or after July 1, 1997, and prior to July 1, 2009, any downhole operation in an existing oil well or natural gas well that is conducted to establish production of oil or natural gas from any geologic interval not currently completed or producing in such existing oil or natural gas well within the same or a different geologic formation. Production Enhancements – Workovers. A rebate of gross production tax may apply to the following: (A) Any downhole operation in an existing oil or natural gas well that is designed to sustain, restore or increase the production rate or ultimate recovery in a geologic interval currently completed or producing in said existing oil or natural gas well. (B) For production enhancement projects having a project beginning date prior to July 1, 1997, “workover” includes, but is not limited to, acidizing, reperforating, fracture treating, sand/paraffin removal, casing repair, squeeze cementing, setting bridge plugs to isolate water productive zones from oil or natural gas productive zones, or any combination thereof. (C) For production enhancement projects having a project beginning date on or after July 1, 1997, and prior to July 1, 2009, “workover” includes, but is not limited to, acidizing; reperforating; fracture treating; sand, paraffin, or scale removal or other wellbore cleanouts; casing repair; squeeze cementing; installation of compression on a well or group of wells or artificial lifts on oil, natural gas, or oil and natural gas wells, including plunger lifts, rod pumps, submersible pumps and coiled tubing velocity strings; downsizing existing tubing to reduce well loading; downhole commingling; bacteria treatments; upgrading the size of pumping unit equipment; setting bridge plugs to isolate water production zones; or any combination thereof. “Workover” shall not mean the routine maintenance, routine repair, or like-for-like replacement of downhole equipment such as rods, pumps, tubing, packers, or other mechanical devices. Qualified production

Oklahoma

	enhancements shall be exempt for a period of 28 months from the date of first sale after project completion. The new version of this law extends the sunset from July 1, 2009, to July 1, 2012.
URL	http://webserver1.lsb.state.ok.us/OK_Statutes/CompleteTitles/os68.rtf

Oregon

Oregon

Topic:	Increasing Production
Category	Tax Incentive
Citation	Or. Rev. Stat. § 324.080
Title	<i>14.001 First \$3,000 in Gross Sales Value</i>
Discussion	An exemption from the tax levied on oil or gas severance is granted for the first \$3,000 in gross sales value of the gross production each calendar quarter from each well.
URL	
Topic:	Regulatory Streamlining
Category	Tax Incentive
Citation	Or. Rev. Stat. § 324.090(1)
Title	<i>14.002 State and Local Interests</i>
Discussion	Any royalty or other interest in oil or gas owned by the state or local government is exempt from the oil and gas severance tax.
URL	
Topic:	Regulatory Streamlining
Category	Tax Incentive
Citation	Or. Rev. Stat. § 324.090(2)
Title	<i>14.003 Credit for Property Taxes Paid</i>
Discussion	A credit is allowed against the oil and gas severance tax for all property taxes imposed. This includes taxes on any property rights attached to the right to produce oil and gas, producing oil and gas leases, and machinery and equipment used in the operation of the well.
URL	

Pennsylvania

Pennsylvania

Topic:	Coalbed Methane (CBM)
Category	Tax incentive
Citation	58 Pa. Stat. Ann. § 507
Title	<i>Minimum Distance Between Gas Wells</i>
Discussion	HB 2804 amended this section to repeal the 330-foot setback requirement; 2004 Pa. Legis. Serv. Act 2004-171 from the lease line for gas wells to be drilled in areas underlain by deep mineable coal seams. This is to allow the development on smaller parcels while maintaining coordination with coal resources.
URL	http://www.dep.state.pa.us/dep/deputate/minres/oilgas/Act214uc.htm#Sec7
Topic:	Data Access
Category	Resource
Citation	
Title	<i>Well Production Data</i>
Discussion	Pennsylvania regulators are working to change their laws concerning well production data, mud logs, and other information gathered from oil and gas producers. They are using examples from other producing states such as Texas and Oklahoma to show that posting this data will spur business development because operators are more likely to commit the millions of dollars necessary for exploration when they have this information in advance.
URL	
Topic:	New production
Category	Laws and Regulation
Citation	PA Act 115
Title	<i>Dormant Oil and Gas Act</i>
Discussion	The purpose of this act is to facilitate the development of subsurface properties by reducing the problems caused by fragmented and unknown or unlocatable ownership of oil and gas interests and to protect the interests of unknown or unlocatable owners of oil and gas. It allows the know owner to proceed with development by establishing a trust for

Pennsylvania

	the proceeds due the unknown owner.
URL	#http://www.legis.state.pa.us/cfdocs/billinfo/billinfo.cfm?year=2005&sind=0&body=S&type=B&BN=0594#
Topic:	Orphaned and Abandoned Wells
Category	
Citation	71 Pa. Stat. Ann. § 1934-A
Title	
Discussion	Grandfathering Pre-Act Wells from Bonding. Bonding is not required for any well drilled prior to April 18, 1985, the date of the Oil and Gas Act, or for on-site disposal of residual waste at these well sites.
URL	
Topic:	Orphaned and Abandoned Wells
Category	Laws and Regulation
Citation	Pa. Laws 223, Chapter 6, § 601(c)
Title	<i>Well Plugging Funds</i>
Discussion	Orphan Wells. Permit fees are waived for producers who recondition an orphaned well from the Department of Environmental Protection's plugging inventory and return it to production.
URL	http://www.dep.state.pa.us/dep/deputate/minres/oilgas/act223ch4_6.htm#Sec_601
Topic:	Regulatory Streamlining
Category	Tax incentive
Citation	73 P.S. § 2260.101 et. Seq.
Title	<i>Regulatory Electronic Transactions</i>
Discussion	Electronic Transactions Act. In December of 1999 the Pennsylvania Legislature passed this version of the Uniform Electronic Transactions Act. This legislation can be considered an incentive in that it allows for the electronic submission of permit applications and required reports.

Pennsylvania

URL	

South Dakota

South Dakota

Topic:	Environmental Audits
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 1-40-3
Title	<i>Qualifications of secretary.</i>
Discussion	See S.D. Codified Laws Ann. § 1-40-33
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=1-40-3
Topic:	Environmental Audits
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 1-40-33
Title	<i>Voluntary Environmental Audits</i>
Discussion	Voluntary environmental audit privilege provides limited immunity for violations of environmental law, rule, regulation, or permit enforced by the Department of Environment and Natural Resources that are discovered and reported to the department within 30 days. The department is prohibited from prosecuting those violations if they are corrected within 60 days. If the violations are not corrected within 30 days, a written compliance schedule may be negotiated between the department and the operator. The department is prohibited from requesting the results of an environmental audit. The environmental audit may not be used as a civil or criminal defense if the producer: (a) willfully and knowingly committed the violation; (b) has a pattern of repeated violations; (c) has not corrected the violation within 60 days of discovery; and (d) has been penalized for a violation within two years of disclosure of the present violation.
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=1-40-33
Topic:	Environmental Audits
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 1-40-34
Title	<i>Application of environmental audit provisions--Discovery of violations.</i>
Discussion	See S.D. Codified Laws Ann. § 1-40-33

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URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=1-40-34
Topic:	Environmental Audits
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 1-40-35
Title	<i>Environmental audit subject to discovery--Summary of disclosed violation.</i>
Discussion	See S.D. Codified Laws Ann. § 1-40-33
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=1-40-35
Topic:	Environmental Audits
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 1-40-36
Title	<i>Use of environmental audit as defense.</i>
Discussion	See S.D. Codified Laws Ann. § 1-40-33
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=1-40-36
Topic:	Hydraulic fracturing
Category	Laws and Regulation
Citation	S.D. Admin. R. 74:10:09:12
Title	<i>Secretary to Set Maximum Injection Pressure</i>
Discussion	As the rule was written, the maximum injection pressure could not cause new fractures in the formation into which the fluid is injected. In 2007, the DENR changed the rule so the maximum injection pressure does not cause new fractures in the confining zone. The state believes this change is protective of potential underground sources of drinking water, and is consistent with the surrounding states' Class II requirements and EPA guidance.
URL	http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:10:09:12

South Dakota

Topic:	Increasing Production
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 10-39A-3.1
Title	<i>Point of imposition of severance tax</i>
Discussion	Natural Gas Sold Out of State. The mineral severance tax is imposed at the time natural gas is sold or consumed, whichever occurs first. This effectively eliminates severance tax on natural gas sold out of state.
URL	
Topic:	Public Lands Production
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 5-7-41
Title	<i>Assignment of certain state-owned minerals to oil and gas royalty increment status-- Required findings.</i>
Discussion	Oil and Gas Royalty Increment Status. The Commissioner of School and Public Lands can grant significantly lower state royalty rates on school and public lands, when no lease has been issued within the last 10 years, and no prospecting or exploration permit for oil and gas has been issued in the last five years. There cannot have been oil or gas production on the state-owned land or land within the immediate area. The rate may be lowered to 1/16 for the first three years of the lease, 1/12 for the second three years, and a minimum of 1/8 thereafter.
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=5-7-41
Topic:	Public Lands Production
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 5-7-42
Title	<i>See S.D. Codified Laws Ann. § 5-7-41</i>
Discussion	Amount of royalty for leases of lands assigned oil and gas royalty increment status.
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=5-7-42

South Dakota

Topic:	Public Lands Production
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 5-7-43
Title	<i>See S.D. Codified Laws Ann. § 5-7-41</i>
Discussion	Royalty increments for commingled lands assigned oil and gas royalty increment status.
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=5-7-43
Topic:	Public Lands Production
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 5-7-44
Title	<i>See S.D. Codified Laws Ann. § 5-7-41</i>
Discussion	Leases offered only during term of royalty increment status.
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=5-7-44
Topic:	Public Lands Production
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 5-7-45
Title	<i>See S.D. Codified Laws Ann. § 5-7-41</i>
Discussion	Commissioner authorized to issue leases for prospecting, exploration and mining.
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=5-7-45
Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	S.D. Codified Laws § 45-9-40
Title	<i>Order of board for unit operation of a pool the percentage of owners required to ratify an oil and gas unit</i>
Discussion	To encourage more exploration and increase production of oil and gas resources in South Dakota while protecting all owners' rights and preventing the drilling of unnecessary wells,

South Dakota

	the South Dakota Legislature approved, and Governor Rounds signed HB1014. The statute, 45-9-40, took effect July 1, 2004.
URL	http://legis.state.sd.us/sessions/2004/bills/HB1014enr.pdf
Topic:	Services
Category	Tax incentive
Citation	S.D. Codified Laws Ann. § 10-45-5.3
Title	<i>Tax on Oil and Gas Field Services</i>
Discussion	Oilfield Services. An oilfield services sales tax provision provides a 1% tax exemption on oilfield services. The effective tax rate is 3%.
URL	http://legis.state.sd.us/statutes/DisplayStatute.aspx?Type=Statute&Statute=10-45-5.3
Topic:	Shale Gas
Category	Laws and Regulation
Citation	S.D. Admin. R. 74:10:03:16
Title	<i>Procedures for Setting Surface Casing and Production Casing</i>
Discussion	The rule currently requires a minimum of 100 feet of surface casing to protect shallow aquifers in all oil and gas wells. Operators that are exploring for shallow oil and gas in the state asked the department to change the current rule because some of the oil and gas they are targeting is at depths of less than 100 feet. In addition, there are areas in the state where 100 feet of surface casing is not necessary due to the surface geology (shale, glacial till). This rule change will allow the Secretary to waive the minimum 100 feet of surface casing requirement in such cases. The Board of Minerals and Environment held a hearing and approved the change to this rule on July 16, 2008, and the Legislative Interim Rules Committee held a hearing and approved the change to this rule on August 19, 2008.
URL	http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:10:03:16
Topic:	Unitization
Category	Tax incentive
Citation	S.D. Admin. R. 74:10:18
Title	<i>Risk Compensation in Compulsory Pooling and Unitization Orders</i>

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Discussion	Risk Compensation. The rule specifies risk compensation allowed in cases of forced pooling and compulsory unitization. It also allows cost plus 200% in compulsory pooling where interest is derived from a lease or other contract and allows cost plus 100% where interest is not subject to a lease or other contract. It allows cost plus 200% in compulsory unitization where interest is derived from a lease or other contract and allows cost plus 100% where interest is not subject to a lease or other contract. This incentive is to be granted by the South Dakota Department of Environment and Natural Resources Oil and Gas Section.
URL	http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:10:18
Topic:	Unitization
Category	Laws and Regulation
Citation	S.D. Admin. R. 74:10:18
Title	<i>Risk Compensation in Compulsory Pooling and Unitization Orders</i>
Discussion	New rules were approved by the board, reviewed, and approved by the Legislative Research Council, and took effect July 1, 2004.
URL	http://legis.state.sd.us/rules/DisplayRule.aspx?Rule=74:10:18
Topic:	Unitization
Category	Tax incentive
Citation	S.D. Codified Laws § 45-9-40
Title	<i>Order of Board for Unit Operation of a Pool--Not Effective Until Approved by Persons Responsible for Operating Costs</i>
Discussion	Unit Ratification. This change lowered from 75% to 60% the percentage of working interest and mineral interest owners needed to ratify unit operations in cases of compulsory unitization. This incentive is to be granted by the South Dakota Department of Environment and Natural Resources Oil and Gas Section.
URL	http://legis.state.sd.us/sessions/2004/bills/HB1014enr.pdf

Texas

Topic:	Carbon Capture, Geologic Storage, and Transportation (CCGST)
Category	Legislation
Citation	HB 469
Title	<i>AN ACT relating to the establishment of incentives by this state for the implementation of certain projects to capture and sequester carbon dioxide that would otherwise be emitted into the atmosphere.</i> <i>relating to the establishment of incentives by this state for the implementation of certain projects to capture and sequester carbon dioxide that would otherwise be emitted into the atmosphere.</i>
Discussion	In Texas, three bills emerged from the 2009 legislative session that address various aspects of carbon capture and geologic storage. The three bills were as follows: HB 469, SB 1387, AND SB 1796. HB 469 relates to the establishment of incentives for the implementation of certain carbon capture and storage projects.
URL	http://www.capitol.state.tx.us/tlodocs/81R/billtext/doc/HB00469F.doc
Topic:	Carbon Capture, Geologic Storage, and Transportation (CCGST)
Category	Legislation
Citation	SB 1387
Title	<i>AN ACT relating to the implementation of projects involving the capture, injection, sequestration, or geologic storage of carbon dioxide.</i>
Discussion	In Texas, three bills emerged from the 2009 legislative session that address various aspects of carbon capture and geologic storage: HB 469, SB 1387, SB 1796. SB 1387 identifies regulatory jurisdiction for onshore carbon geologic storage in the state and specifying requirements, including permitting, financial assurance, monitoring and inspection of storage into formations productive of oil or gas, or brine formations above or below oil or gas formations. Jurisdiction is vested in the Railroad Commission of Texas (RRC) except for storage into non-oil and gas producing formations, which must be studied before further legislative action is taken. The RRC is also tasked with adopting geologic storage regulations consistent with eventual EPA rules for geologic storage.
URL	http://www.capitol.state.tx.us/tlodocs/81R/billtext/doc/SB01387F.doc

Topic:	Carbon Capture, Geologic Storage, and Transportation (CCGST)
Category	Legislation
Citation	SB 1796
Title	<i>AN ACT relating to the development of carbon dioxide capture and sequestration in this state.</i>
Discussion	In Texas, three bills emerged from the 2009 legislative session that address various aspects of carbon capture and geologic storage: HB 469, SB 1387, SB 1796. SB 1796 relates to the development of offshore carbon geologic storage. The Texas Commission on Environmental Quality is tasked with developing standards and rules for such storage. SB 1796 also requires the TCEQ, the RRC and the Texas Public Utility Commission to participate in the federal government process for developing federal greenhouse gas reporting and registry requirements and requires TCEQ to adopt those requirements by reference.
URL	http://www.capitol.state.tx.us/tlodocs/81R/billtext/doc/HB01796F.doc
Topic:	Carbon Capture, Geologic Storage, and Transportation (CCGST)
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 202.0545
Title	<i>Tax Exemption for Enhanced Recovery Projects Using Anthropogenic Carbon Dioxide</i>
Discussion	The law requires the Railroad Commission to issue certification if the CO ₂ used in the EOR project is to be sequestered in a reservoir productive of oil or natural gas. The Texas Commission on Environmental Quality (TCEQ) issues the certification if the CO ₂ used in the EOR project is to be sequestered in a formation other than a reservoir productive of oil or natural gas. Both the RRC and TCEQ issue certifications if the CO ₂ is sequestered in both a formation not productive of oil or natural gas and a reservoir of oil or natural gas.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.0545
Topic:	Data Access
Category	Resource
Citation	
Title	<i>Commission Website</i>
Discussion	The Railroad Commission of Texas is integrating its geographic information systems (GIS), business applications, and electronic images of documents. From the GIS Public Viewer,

	the Commission has established links to allow the public to view oil and gas well attributes, permit information, production data, and well log and completion packet document images. From this foundation, the Commission provides users with flexible access to information and services. Data available from the Texas site include: Drilling Permit Application Query Oil and Gas Proration Schedules Listed by Operator, Gatherer, Purchaser and Field Oil Production and Well Counts Production Adjustment Factor: Each month the Commission reports preliminary Texas production of crude oil and gas based on producer filings of Form PR. Preliminary production totals are key indicators for many industry analysts, who use the data to forecast U. S. oil and natural gas supply and demand and to measure industry activity and performance. Public GIS Map Viewer for Oil, Gas, and Pipeline Data: The Commission's Public GIS Map Viewer for Oil, Gas, and Pipeline Data combines detailed information and location coordinates for oil wells, gas wells, and pipelines from the Railroad Commission's files with base map data from the U.S. Geological Survey 7.5 minute quadrangle maps. These interactive maps were developed using Environmental Systems Research Institute, Inc. (ESRI) ArcIMS software, and they interface with the Commission's Production Data Query Well Logs List for the Public GIS Map Viewer for Oil, Gas and Pipeline Data: The Railroad Commission began scanning well logs in June 2004. Images of all well logs filed with the Commission on or after June 2004 to satisfy the requirements of 16 TAC § 3.16 (Statewide Rule 16) are available through the Website. Drilling Permit (W-1) Subscriptions: Information concerning well records, well counts, distribution tables and by county data are available, as are links to other well-related information.
URL	
Topic:	Deep Wells
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 201.057(c)
Title	<i>Temporary Exemption or Tax Reduction for Certain High-Cost Gas</i>
Discussion	Extension on the tax rate reduction for high-cost natural gas wells. There is a 100% reduction for up to 120 months or until cumulative value of exemption equals 50% of drilling and completion cost. The total allowable credit for taxes paid for reporting periods before the date the application is filed may not exceed the total tax paid on the natural gas that otherwise qualified for the exemption or tax reduction and that was produced during the 24 months immediately preceding the month in which the application for certification

	under this section was filed with the commission. The 78th Texas Legislature removed the filing deadline and made the severance tax exemption permanent. This corresponds to HB 2424.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.201.htm
Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 202.054
Title	<i>Qualification of Oil from New or Expanded Enhanced Recovery Project for Special Tax Rate</i>
Discussion	The severance tax is reduced by 50% (from 4.6% to 2.3%) for oil production from new enhanced oil recovery projects and incremental production from expanded projects for 10 years after RRC certification of production response. The RRC certification is a three-step process: first, (Form H-12), the operator seeks approval and area certification for the new/expanded project; second, (Form H-13), the operator seeks RRC certification that the project evidences a positive production response (an increased rate of production attributable to the project); third, (Form H-14), the operator files an annual status report without which the credits are not validated. The application for positive production response certification must be filed within three years of project approval for secondary enhanced recovery, and within five years for tertiary recovery. The 78th Texas Legislature removed the filing deadline and made the severance tax exemption permanent.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.054
Topic:	Environmental Audits
Category	Tax incentive
Citation	HB 2473
Title	<i>Texas Environmental, Health, and Safety Audit and Compliance Management System Privilege Act.</i>
Discussion	The act encourages businesses to voluntarily comply with environmental and occupational health and safety laws by performing audits and implementing compliance management systems. (1995)
URL	http://www.capitol.state.tx.us/tlodocs/74R/billtext/doc/HB02473F.doc

Texas

Topic:	Hydraulic fracturing
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 151.355
Title	<i>Water Related Incentives</i>
Discussion	Tax Incentive for Reuse/Recycling of Fracturing Water – The law provides for an exemption from sales, excise, and use taxes, tangible personal property specifically used to process, reuse, or recycle wastewater that will be used in fracturing work performed at an oil or gas well. Corresponds to House Bill 4.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.151.htm#http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.151.htm#151.355
Topic:	Marginal Wells
Category	Laws and Regulation
Citation	Tex. Nat. Res. Code Ann. § 32.067
Title	<i>Marginal Property Royalty Rates</i>
Discussion	The Texas School Land Board may grant a reduced royalty rate for a period of two years for marginally economic state leases. To qualify, the lease must produce an average of 15 barrels per day per well, or an average of 90 Mcf of gas per day per well. Once the reduced rate is granted, royalty rates will not increase for that lease for two years. Additional reductions can be applied for at the expiration of the two-year period. This tax reduction applies when oil prices average less than \$25 per barrel.
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.32.htm#32.067
Topic:	Marginal Wells
Category	Laws and Regulation
Citation	Tex. Nat. Res. Code Ann. § 86.091
Title	<i>Marginal Gas Wells and Limits on Well Restrictions</i>
Discussion	The RRC can exempt marginal gas wells from otherwise applicable production limitations if the wells are located in gas fields without special field rules. A marginal gas well is defined in the Texas Natural Resources Code as a gas well incapable of producing more than 250,000 cubic feet of gas per day under normal operating conditions. Prior to this legislation, the RRC was precluded from exempting individual marginal wells that exist in fields with other wells capable of producing above marginal limits. This legislation replaced

	the RRC's requirement to limit production from gas wells producing more than 100,000 cubic feet of gas per day unless it is a marginal well in a field for which special field rules are not in effect.
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.86.htm#86.091
Topic:	Marginal Wells
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 202.057
Title	<i>Incremental Production Incentive</i>
Discussion	Leases with wells that averaged seven BOE (barrels of oil equivalent) a day or less in 1996 are eligible for a fifty percent tax reduction on incremental production. The period from September 1, 1997 through December 31, 1998 will be used to determine any increase in production over the 1996 baseline level. The exemption is granted as long as the price of oil, as judged by the Comptroller, remains below \$25 (adjusted to 1997 dollars). It is suspended if the price reaches \$25 or above for three consecutive months and reinstated when it is below \$25 for three consecutive months.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.058
Topic:	New Technology Usage
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 202.061
Title	<i>Tax Credit for Enhanced Efficiency Equipment</i>
Discussion	Provides for a severance tax credit for enhanced efficiency equipment installed on marginal oil wells between September 1, 2005, and September 1, 2009. "Enhanced efficiency equipment" means equipment used in the production of oil that reduces the energy used to produce a barrel of fluid by 10 percent or more when compared to commonly available alternative equipment. The term does not include a motor or downhole pump. Equipment does not qualify as enhanced efficiency equipment unless an institution of higher education approved by the comptroller that is located in this state and that has an accredited petroleum engineering program evaluated the equipment and determined that the equipment does produce the required energy reduction.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.061

Topic:	Orphaned and Abandoned Wells
Category	Laws and Regulation
Citation	HB 2161
Title	<i>AN ACT relating to the power of the Railroad Commission of Texas to adopt and enforce safety standards and practices applicable to the transportation by pipeline of certain substances and to certain pipeline facilities, the provision of severance tax credits and exemptions and other incentives and procedures for producing oil or gas from certain wells or plugging wells, and the procedure for computing severance taxes in connection with certain gas sales; imposing an administrative penalty.</i>
Discussion	See Texas Natural Resources Code § 89.047; adopted by 79th Legislature
URL	http://www.capitol.state.tx.us/tlodocs/79R/billtext/pdf/HB02161F.pdf
Topic:	Orphaned and Abandoned Wells
Category	Tax Incentive
Citation	Tex. Nat. Res. Code Ann. § 89.047
Title	<i>Exemption for Gas from Reactivated Orphaned Wells</i>
Discussion	An exemption for gas and casinghead gas from a well certified as an "orphan well" by the Texas Railroad Commission. An orphan well is defined in Section 89.047(a)(3) of the Natural Resources Code as one that has a commission permit, has not reported production for the preceding 12 months, and whose current operator's commission-approved organization report has lapsed. When a certified orphan well is put back into production by a certified orphan well operator, the well will be eligible for a 100 percent exemption from natural gas production tax and the oilfield cleanup fee for as long the certified operator operates the well. Effective January 1, 2006.
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.89.htm#89.047
Topic:	Orphaned and Abandoned Wells
Category	Laws and Regulation
Citation	Tex. Nat. Res. Code Ann. § 89.047
Title	<i>Orphaned Well Reduction Program</i>
Discussion	An orphaned well under this program is defined as a well that has been inactive for 12 months where the operator of the well no longer has a current registration with the Railroad Commission as required by Texas statute. Under the program, a prospective new

	operator may nominate the well and be given a 30-day period during which he can (through visual means and non-invasive testing methods) inspect the well to determine whether the person wishes to assume operatorship of the well. If so, the operator provides evidence of a good-faith claim to the right to produce minerals from the well, files paperwork with the Commission to assume operatorship of the well, and remits a \$250 fee. If an orphaned well is taken over by a new operator under this program during the effective period (i.e., January 1, 2006, to December 31, 2007), the operator is entitled to receive: (1) a non-transferable exemption from severance taxes for all future production from a well under Tax Code §202.060; (2) a non-transferable exemption from the fees provided by Natural Resources Code §§81.116 and 81.117 (oil and gas regulatory fees paid into the Oilfield Cleanup Fund based on production) for all future production from the well; and (3) a payment from the Commission in an amount equal to the depth of the well times \$0.50/foot if, not later than the third anniversary of the date the operator acquires the well, the operator brings the well back into continuous active operation or plugs the well in accordance with Commission rules. (Note that payments under this program are made in the order that operators qualify for them. The Commission is limited to total payments of \$500,000 under this program per fiscal year. Operators may not receive more than one payment for a particular well, nor may they receive aggregate payments in excess of the amount of financial security posted under Natural Resources Code §91.104.)
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.89.htm#89.047
Topic:	Orphaned and Abandoned Wells
Category	Tax Incentive
Citation	Tex. Tax Code Ann. § 202.060
Title	<i>Exemption for Oil or Gas from Reactivated Orphan Wells</i>
Discussion	See Texas Natural Resources Code §89.047
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.060
Topic:	Public Land Production
Category	Tax Incentive
Citation	Tex. Admin. Code Title 31 § 1.97
Title	<i>Non-Use</i>
Discussion	See Tex. Nat. Res. Code Ann. § 32.067
URL	http://info.sos.state.tx.us/pls/pub/readtac\$ext.TacPage?sl=R&app=2&p_dir=&p_rloc=951

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Topic:	Public Land Production
Category	Tax Incentive
Citation	Tex. Nat. Res. Code Ann. § 52.011
Title	<i>Lease of Public School and Gulf Land</i>
Discussion	"Royalty rates are reduced for production early in the terms of leases. For submerged areas, production in years one and two earns a royalty of 20%; production in years three and four earns 22%. For uplands production, year one earns a royalty rate of 20%; production in year two earns 22.5%. Goal: Maintain overall royalty revenue while providing an operator greater working interest revenue. Impact: The effectiveness of this incentive has not been studied, but it is reported that more activity occurs earlier in the terms of leases since the rule took effect than prior to implementation of the incentive. The program benefits both the state and operators. Active Supporters: TIPRO, Texas Mid-Continent Oil and Gas Association, and Industry "
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.52.htm#52.011
Topic:	Public Lands Production
Category	Tax incentive
Citation	Tex. Nat. Res. Code Ann. § 32.067
Title	<i>Marginal Property Royalty Rates</i>
Discussion	The Texas School Land Board may grant a reduced royalty rate for a period of two years for marginally economic state leases. To qualify, the lease must produce an average of 15 BOPD per well, or an average of 90 Mcf of gas per day per well. Once the reduced rate is granted, royalty rates will not increase for that lease for two years. Additional reductions can be applied for at the expiration of the two-year period. This tax reduction applies when oil prices average less than \$25 per barrel.
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.32.htm#32.067

Topic:	Regulatory Streamlining
Category	Laws and Regulation
Citation	
Title	<i>Severance Tax Administration</i>
Discussion	Removal of accelerated biennial due date (“speed up”) for natural gas severance taxes and penalties for speeding up late payments. Eliminates early payment of natural gas tax in odd-numbered years. Agency: Comptroller of Public Accounts.
URL	
Topic:	Regulatory streamlining
Category	Tax incentive
Citation	Tex. Nat. Res. Code Ann. § 91.402(d)
Title	<i>Time for Payment of Proceeds</i>
Discussion	Producers may delay payment of royalties until they reach a total of \$100 or 12 months proceeds have accumulated, whichever comes first. Annual reporting for the lease may not exceed \$3,000. This corresponds to HB 1593.
URL	http://www.statutes.legis.state.tx.us/Docs/NR/htm/NR.91.htm#91.402
Topic:	Returning Idle Wells to Production
Category	Tax incentive
Citation	Tex. Tax code Ann. § 202.056
Title	<i>Exemption for Oil and Gas Wells Previously Inactive</i>
Discussion	The Two-Year Inactive Well Incentive program, extended by the Legislature in September 1999, remains a valuable opportunity for operators of inactive wells to return the wells to production with a 10-year severance tax exemption on crude oil, casinghead gas, and gas well gas produced by the reactivated wells. The filing deadline for this severance tax incentive program was extended to August 31, 2009. The Railroad Commission can certify wells for the program through February 28, 2010. Any gas well or oil well with no more than one month of production in the two-year period prior to application to the Commission for certification can be eligible. The Commission designates monthly all oil and gas wells that meet the above criteria. Operators of these wells will be notified by letter of their initial eligibility for the exemption. Eligible wells are also identified on the Oil and Gas Schedule listed by operator with a single asterisk. As of November 13, 2000, more

	95,000 wells have been designated. If a designated well was returned to production prior to August 31, 2009, and the operator files a W-10/G-10 retest or a W-2 retest, the Commission will send a letter to the operator. By signing the bottom of that letter and returning it to the Commission, an operator is applying for certification in the program. Upon approval, a certification letter will be issued to the operator. This certification, along with Comptroller Form AP-158, is then filed with the Comptroller of Public Accounts to receive the tax exemption. Certified wells are identified on the schedule with double asterisks. As of November 13, 2000, more than 4,000 wells had been certified in the program. If necessary, an operator can request a one-time listing of designated and certified wells for his company.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.056
Topic:	Venting/Flaring of Gas
Category	Tax Incentive
Citation	HB 2982
Title	<i>AN ACT relating to the transfer of the regulation of injection wells used for in situ uranium mining from the Texas Commission on Environmental Quality to the Railroad Commission of Texas.</i>
Discussion	See Tex. Tax Code Ann. § 202.058
URL	http://www.capitol.state.tx.us/tlodocs/79R/billtext/pdf/HB02982I.pdf
Topic:	Venting/Flaring of Gas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 201.058
Title	<i>Incentive to Market Previously Flared or Vented Casinghead Gas</i>
Discussion	If an operator markets casinghead gas that had previously been released into the air (vented or flared) for 12 months or more in compliance with Commission rules and regulations, the operator may receive a severance tax exemption on that gas for the life of the well.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.201.htm

Texas

Topic:	Venting/Flaring of Gas
Category	Tax Incentive
Citation	Tex. Tax Code Ann. § 201.059
Title	<i>Credits for Qualifying Low-Producing Wells</i>
Discussion	See Tex. Tax Code Ann. § 202.058
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.201.htm#201.059
Topic:	Venting/Flaring of Gas
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 202.058
Title	<i>Credits for Qualifying Low-Producing Oil</i>
Discussion	Flared Casinghead Gas. If an operator markets casinghead gas that previously had been released to the air (vented or flared) for 12 months or more in compliance with RRC rules and regulations, the operator may receive a severance tax exemption for that gas for the life of the oil well or lease.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.201.htm
Topic:	Water Management
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 151.355
Title	<i>Water Related Incentives</i>
Discussion	Tax Incentive for Reuse/Recycling of Fracturing Water – the incentive provides for an exemption from sales, excise, and use taxes, tangible personal property specifically used to process, reuse, or recycle wastewater that will be used in fracturing work performed at an oil or gas well. Corresponds to House Bill 4.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.151.htm#151.355
Topic:	Workovers
Category	Tax incentive
Citation	Tex. Tax Code Ann. § 202.061

Title	<i>Tax Credit for Enhanced Efficiency Equipment</i>
Discussion	The code provides for a severance tax credit for enhanced efficiency equipment installed on marginal oil wells between September 1, 2005, and September 1, 2009. "Enhanced efficiency equipment" means equipment used in the production of oil that reduces the energy used to produce a barrel of fluid by 10 percent or more when compared to commonly available alternative equipment. The term does not include a motor or downhole pump. Equipment does not qualify as enhanced efficiency equipment unless an institution of higher education approved by the comptroller that is located in this state and that has an accredited petroleum engineering program evaluated the equipment and determined that the equipment does produce the required energy reduction.
URL	http://www.statutes.legis.state.tx.us/Docs/TX/htm/TX.202.htm#202.061

Utah

Utah

Topic:	Data Access
Category	Resource
Citation	
Title	<i>Utah Geological Survey</i>
Discussion	The Utah Geological Survey provides valuable technical publications on oil and gas reserves and also operates the Utah Core Research Center in a 12,000-foot warehouse.
URL	
Topic:	Data Access
Category	Resource
Citation	
Title	<i>ePermit</i>
Discussion	The Division of Oil, Gas and Mining has electronic permitting of oil and gas wells and electronic sundry notice approval available to well operators. DOGM's Website is highly regarded for access to oil and gas statistics and detailed well information and logs on the Internet.
URL	
Topic:	Discovery Wells
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(5)(b)
Title	<i>Wildcat Wells</i>
Discussion	No severance tax is imposed on the first 12 months of production from wildcat wells started after Jan. 1, 1990.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102

Topic:	Discovery Wells
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(5)(c)
Title	<i>New Development Wells</i>
Discussion	The first six months of production for development wells started after Jan. 1, 1990, is exempt from severance taxes.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102
Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(7)
Title	<i>Enhanced Recovery</i>
Discussion	A 50% reduction in severance tax is available for the incremental production achieved from an enhanced oil or gas recovery project.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102
Topic:	Increasing production
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(2)
Title	<i>Variable Severance Tax Rate</i>
Discussion	For oil, the severance tax rate is 3% up to and including the first \$13 per barrel, and 5% of the value exceeding \$13 per barrel. The severance tax rate natural gas is 3% for the first \$1.50 per Mcf, and 5% of value above \$1.50.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102
Topic:	Marginal Wells
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(5)(a)
Title	<i>Marginal/Stripper Wells</i>

Discussion	Stripper wells are severance tax exempt unless the exemption prevents the severance tax from being treated as a deduction for federal tax purposes. Stripper wells are defined as wells that produce an average of less than 20 barrels per day for one year, or 60 Mcf or less of natural gas per day for 90 consecutive days.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102
Topic:	Workovers
Category	Tax incentive
Citation	Utah Code Ann. § 59-5-102(6)
Title	<i>Workovers/Recompletions</i>
Discussion	A working interest owner who pays for all or part of the expenses of a recompletion or workover is entitled to a nonrefundable tax credit equal to 20 percent of those expenses. The tax credit may not exceed \$30,000 per well during each calendar year.
URL	http://le.utah.gov/UtahCode/getCodeSection?code=59-5-102

Virginia

Virginia

Topic:	Coalbed Methane (CBM)
Category	Tax incentive
Citation	Va. Code Ann. § 45.1-361.22
Title	<i>Pooling of Interest for Coalbed Methane Gas Wells; Conflicting Claims to Ownership</i>
Discussion	Escrow of Coalbed Methane Conflicting Ownership Claims. Established under section 45.1-361.22 of the Virginia Gas and Oil Act, the Virginia Gas and Oil Board may escrow proceeds from a coal seam natural gas production well in a unit where there are conflicting claims to ownership. The Board pays the escrowed proceeds when there is a final decision of a court of competent jurisdiction or agreement among conflicting claimants addressing the ownership of the gas. The Virginia Department of Mines, Minerals and Energy has determined that this section of the Virginia Code has been one key factor that has led to increases in coal seam natural gas production from nominal levels in 1989 to nearly 70 BCF/year.
URL	http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+45.1-361.22
Topic:	Coalbed Methane (CBM)
Category	Laws and Regulation
Citation	Va. Code Ann. § 45.1-361.29.F.2 (amended by 1996 Va. Acts 759 and 765)
Title	<i>Consent to Stimulate Coalbed Methane</i>
Discussion	The Virginia Gas and Oil Act requires a producer of coal seam natural gas to obtain consent from the operator of each coal seam located within 750 horizontal feet of a well or 100 vertical feet of any coal seam to be stimulated. A 1997 amendment to this requirement provides that this consent shall be deemed to be granted for any tract where title to the coal is held by multiple owners who have not leased the tract for coal development when the gas operator obtains consent from the co-owners holding a majority interest in the tract. The goal of this act is to allow production of coal seam natural gas when the consent to stimulate cannot be obtained from all co-owners of a tract of coal.
URL	http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+45.1-361.29

Virginia

Topic:	Coalbed Methane (CBM)
Category	Tax incentive
Citation	Va. Code Ann. § 58.1 - 439.2
Title	<i>Coalfield Employment Enhancement Tax Credit</i>
Discussion	One cent per million BTUs of coal seam natural gas production is credited to the producer.
URL	http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+58.1-439.2
Topic:	Data Access
Category	Resource
Citation	
Title	<i>Data Information System</i>
Discussion	The Virginia Division of Mineral Resources conducts research and provides information about the state's gas and oil resources for the gas and oil industry. The division maintains all information on coreholes, geologic features in gas and oil bearing areas, and a database on wells drilled in the Commonwealth.
URL	
Topic:	Economic Stimulation
Category	Laws and Regulation
Citation	Va. Code Ann. § 56-265.1 (4)
Title	<i>Direct Sales of Natural Gas by Producers</i>
Discussion	Producers of natural gas may sell directly to as many as 35 commercial and industrial customers without having to become certified as a public utility. Certain public schools are also customers not to be classified as a public utility. The customer limit was raised during the 1997 Virginia General Assembly session from a 10-customer limit. The number of schools are not limited and it does not count against the "fewer than 35" requirement.
URL	http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+56-265.1
Topic:	Services
Category	Tax incentive

Virginia

Citation	Va. Code Ann. § 58.1-609.3 (12)
Title	<i>Commercial and Industrial Use Exemptions</i>
Discussion	Raw materials, fuel, power, energy, supplies, machinery, tools and repair/replacement parts used directly in the drilling, extraction, refining, or processing of natural gas or oil and reclamation of the well area are exempt from the 4% state sales and use tax, and the 1% local sales and use tax. Exemption includes all phases of production and processing, including gathering, until gas is pipeline quality.
URL	http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+58.1-609.3

West Virginia

West Virginia

Topic:	Coalbed Methane (CBM)
Category	Laws and Regulation
Citation	GP-WV-1-07
Title	<i>General Water Pollution Control Permit, Permit Number: GP-WV-1-07</i>
Discussion	This General Permit establishes a simple, efficient and economical method for the disposal and regulation of water produced from coalbed methane production that is fully protective of the environment. The Permit strengthens the concept of environmental impact prevention by including provisions for background sampling and sampling in control areas to establish a baseline for evaluating the impact of land applied water on the environment. The Permit incorporates new parameters to the regular sampling process, which will provide information used for soil and groundwater protection and considers more exhaustive monitoring methods for groundwater.
URL	
Topic:	Coalbed Methane (CBM)
Category	Tax incentive
Citation	WV Code Chapter 11, Article 13A-3d
Title	<i>Imposition of tax or privilege of severing coal, limestone or sandstone, or furnishing certain health care services, effective dates for reduction of severance rate for coal mined by underground methods based on seam thickness -- Tax in addition to other taxes</i>
Discussion	Severance Tax exemption/reduction for coalbed methane. Effective January 1, 2009; this exemption is designed to encourage capture of methane gas that would otherwise be vented to the atmosphere.
URL	http://www.legis.state.wv.us/WVCODE/Code.cfm?chap=11&art=13A#13A
Topic:	Data Access
Category	Resource
Citation	
Title	<i>Water Withdrawal from West Virginia Streams Guidance</i>

West Virginia

Discussion	This application, available on the Department of Environmental Protection webpage, provides oil and gas operators with real-time information for withdrawing water from a stream in an environmentally safe manner.
URL	http://gisonline.dep.wv.gov/wwt/index.html
Topic:	Data Access
Category	Resource
Citation	
Title	<i>WV DEP Resource Extraction Data Viewer -- RIA to View Oil and Gas Wells Data</i>
Discussion	This application, available on the Department of Environmental Protection webpage, presents permit information as well as location coordinates for oil wells, gas wells, and underground mine boundaries throughout the state of West Virginia. The application uses base map data from the U.S. Geological Survey (7.5 minute quadrangle maps) and 2007 aerial imagery with one meter resolution.
URL	http://gisonline.dep.wv.gov/fogm/index.html
Topic:	Increasing Production
Category	Legislation
Citation	SB 328
Title	<i>Direct Use Sales Tax Exemption</i>
Discussion	When the exemption from sales tax for contractors was removed in 1989, subcontractors were included for the oil and gas industry, even though contract drillers were still exempt from sales tax on purchases used directly in the production of oil and gas. The 1994 Legislature clarified in Senate Bill 328 that this "direct use" exemption was available also to oil and gas subcontractors.
URL	
Topic:	Marginal Wells
Category	Legislation
Citation	HB 2749
Title	<i>Severance Tax Exemption</i>

West Virginia

Discussion	Imposes a tax equal to 5% of the gross value produced for the privilege of severing natural gas or oil. Effective taxable periods beginning on or after Jan. 1, 2000. An exemption from the severance tax is granted for natural gas provided free to surface owners. The exemption is granted to low-volume wells, producing less than 5 Mcf of natural gas per day or oil wells that produced an average of less than one-half barrel of oil per day during the calendar year immediately preceding a given taxable period. Natural gas or oil produced from a well that has not produced marketable quantities for five consecutive years immediately preceding the year in which the well is placed back into production and begins producing marketable quantities is also exempted for a maximum of 10 years.
URL	
Topic:	Marginal Wells
Category	Tax incentive
Citation	WV Code Chapter 11, Article 13A-31
Title	<i>Severance Tax Exemption</i>
Discussion	The rule imposes a tax equal to 5% of the gross value produced for the privilege of severing natural gas or oil. Effective taxable periods begin on or after Jan. 1, 2000. An exemption from the severance tax is granted for natural gas provided free to surface owners. The exemption is granted to low-volume wells, producing less than 5 Mcf of natural gas per day or oil wells that produced an average of less than one-half barrel of oil per day during the calendar year immediately preceding a given taxable period. Natural gas or oil produced from a well that has not produced marketable quantities for five consecutive years immediately preceding the year in which the well is placed back into production and begins producing marketable quantities is also exempted for a maximum of 10 years.
URL	http://www.legis.state.wv.us/WVCODE/Code.cfm?chap=11&art=13A#13A
Topic:	Orphaned and Abandoned Wells
Category	Laws and Regulation
Citation	WV Code Chapter 22, Article 6-19
Title	<i>Bona Fide Future Use Program</i>
Discussion	Effective July 1, 1993, wells that have not been producing in the previous 12 months can be designated as having a “bona fide future use.” Such a designation would keep idled wells from being deemed abandoned and avoid subjecting them to a plugging obligation. The goal is to return idled wells to production and encourage new wells.

West Virginia

URL	http://www.legis.state.wv.us/WVCODE/Code.cfm?chap=22&art=6#06
Topic:	Temporary Abandonment
Category	Laws and Regulation
Citation	WV Code Chapter 22, Article 6-19
Title	<i>Bona Fide Future Use Program</i>
Discussion	Wells that have not been producing in the previous 12 months can be designated as having a “bona fide future use.” Such a designation would keep idled wells from being deemed abandoned and avoid subjecting them to a plugging obligation.
URL	http://www.legis.state.wv.us/WVCODE/Code.cfm?chap=22&art=6#06

Wyoming

Wyoming

Topic:	Carbon Capture, Geologic Storage, and Transportation (CCGST)
Category	Legislation
Citation	
Title	
Discussion	In 2008 and 2009 Wyoming passed five total bills covering general carbon sequestration framework, pore space ownership and utilization. Issues of long-term liability are still in development and may be considered in 2010. Work is under way to develop comprehensive ruled, with completion of the process anticipated in December 2009.
URL	
Topic:	Discovery Wells
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	Discovery Wells. Wildcat wells are exempt from severance taxes for a period of four years commencing from the date of first production.
URL	http://michie.lexisnexus.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2
Topic:	Enhanced Oil Recovery (EOR)
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	EOR. In the case of tertiary production of crude oil resulting from injection of carbon dioxide gas, all Wyoming severance taxes paid on the carbon dioxide gas injected shall be deducted from and allowed as a credit against the severance taxes imposed on the oil

Wyoming

	produced by the injection.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2
Topic:	Environmental Audits
Category	Tax incentive
Citation	Wyo. Stat. § 35-11-1105
Title	<i>Environmental Audit Privilege; Exceptions; Burden of Proof; Waiver; Disclosure After in Camera Review; Application</i>
Discussion	This privilege gives oil and gas companies complete immunity from fines and penalties of the Department of Environmental Quality for violations that are reported to the department along with remediation plans.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/18fd2/1a278/1a626/1a64b
Topic:	Environmental Audits
Category	Tax incentive
Citation	Wyo. Stat. § 35-11-1106
Title	<i>Limitation on Civil Penalties; Voluntary Reports of Violations</i>
Discussion	See Wyo. Stat. § 35-11-1105
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/18fd2/1a278/1a626/1a652
Topic:	Hydraulic fracturing
Category	Laws and Regulation
Citation	Chapter 3, Section 8
Title	<i>State of Wyoming Hydraulic Fracturing Rules and Regulations</i>
Discussion	The Oil and Gas Conservation Commission has specific rules regarding the hydraulic fracturing permitting and tracking process. Please see the web page for further details either from the Rules and Regulations tab (full rules and regulations language) or from Notices, Memos and Important Details tab (summary of rules), both located on the home

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	page. For a summary of the hydraulic fracturing rules, click the Notices, Memos and Important Details tab, then click on the upper left column for Hydraulic Fracturing Rules and Regulations July 2009.
URL	
Topic:	Marginal Wells
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	Marginal/Stripper Wells. Wells which produce an annual average of less than 15 barrels per day while the price of oil is less than \$20 per barrel are taxed at 4% (reduced from 6%). When the price of oil is \$20 or more, wells producing 10 barrels per day or less receive the 2% tax reduction.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2
Topic:	Returning Idle Wells to Production
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	Idle wells. Crude oil produced from a previously shut-in well is exempt from severance taxes for the first 60 months of renewed production.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2
Topic:	Venting/Flaring of Gas
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	Natural gas that is vented, flared or reinjected has no value and is exempt from taxation.

Wyoming

URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2
Topic:	Workovers
Category	Tax incentive
Citation	Wyo. Stat. § 39-14-205
Title	<i>Exemptions</i>
Discussion	Workover wells are exempt from severance taxes for a period of 24 months immediately following the workover or recompletion.
URL	http://michie.lexisnexis.com/wyoming/lpExt.dll?f=templates&eMail=Y&fn=main-h.htm&cp=wycode/1c2a1/1c456/1c4b6/1c4e2

Definitions

Definitions

Coalbed Methane (CBM)	CBM, sometimes referred to as “coal seam natural gas,” is methane found in coal seams and produced using unconventional methods. The removal of the methane-rich gas in present in coalbeds is a necessary and sometimes dangerous part of the coal-mining process. In the past, this gas was vented, but advances in technology now make the capture and production of CBM a viable and economic possibility.
Data Access	Access to real-time data saves time, energy, and travel at every stage of oil and gas exploration and production. Computer applications allow oil and gas companies to analyze and interact with a variety of data from multiple sources simultaneously. Geographic Information System (GIS) applications use Global Positioning Systems (GPS) and other tools to assimilate information like topography, soil analysis, climate, property ownership maps, and digitized aerial photos to develop prospects and site plans for oil and gas exploration with minimal environmental impact.
Deep Wells	Deeper wells are often more cost-prohibitive to operators to produce. By incentivizing deep wells, regulatory authorities encourage higher production levels and the development of new and innovative technologies.
Discovery Wells	An exploratory well that encounters a new and previously untapped mineral deposit. A discovery well may open up a new field, or it may locate a new and previously unknown producing horizon in an old field (Williams, Meyers, Martin, & Kramer, 2006)."
Economic Stimulation	
Education	
Enhanced Oil Recovery (EOR)	"The increased recovery from a pool achieved by artificial means or by the application of energy extrinsic to the pool, which artificial means or application includes pressuring, cycling, pressure maintenance, or injection to the pool of a substance or form of energy but does not include the injection in a well of a substance or form of energy for the sole purpose of (i) aiding in the lifting of fluids in the well, or (ii) stimulation of the reservoir at or near the well by mechanical, chemical, thermal, or explosive means." The Alberta Oil and Gas Conservation Act, R.S.A. 1970, c.267, section 2(1)(15) (Williams, Meyers, Martin, & Kramer, 2006).
Environmental Audits	State regulatory agencies encourage the performance of environmental audits by operators and producers. Environmental audits evaluate the environmental impact of operations. By working cooperatively with operators and producers to find solutions to potential environmental problems, rather than adopting a strictly punitive approach, regulators develop relationships that foster “above and beyond” behavior by the community they regulate.

Definitions

Horizontal Drilling	<i>"...a technique whereby the well is initially drilled vertically and then turned and drilled horizontally at an angle to the vertical of anywhere from 79 degrees to 104 degrees. It encompasses high-angle directional drilling of boreholes with lateral penetration through productive reservoirs. Horizontal drilling allows the wellbore to follow the desired formation (Williams, Meyers, Martin, & Kramer, 2006).</i>
Increasing production	States incentivize increased oil and gas production, often for the purposes of increasing production and mitigating the effects of fluctuating market prices. This assists with preventing unemployment and loss of tax revenue as a result of business stoppages during economic fluctuations.
Marginal Wells	A producing well that requires a higher price per MCF or per barrel of oil to be worth producing, due to low production rates and/or high production costs from its location (e.g. far offshore; in deep waters; onshore far from good roads for oil pickup and no pipeline) and/or its high co-production of substances that must be separated out and disposed of (e.g. saline water, non-burnable gasses mixed with the natural gas). A Marginal Well becomes unprofitable to produce whenever oil and/or gas prices drop below its crucial profit point. On land, this is often but not always a stripper well. (IOGCC) Stripper Well: An oil well whose maximum daily average oil production does not exceed 10 bbls oil per day during any consecutive 12 month period. Often used interchangeably with the term "Marginal Well", although they are not the same.
New production	States encourage the responsible development of new plays and fields in order to stimulate local economies.
New Technology Usage	
Offshore Production	
On-site Use of Produced Oil/Gas	States incentivize on-site use of produced oil and gas to reduce the necessity for venting and flaring or other waste management techniques. On-site use as opposed to venting or flaring encourages the recycling of oil and natural gas that otherwise would have been considered a waste product. Incentivizing the use of produced oil and natural gas reduces emissions while allowing for enhanced recovery of the oil and natural gas that might otherwise be left in place. Much of the produced oil and natural gas is used for enhanced or improved recovery methods to aid in lifting the oil and natural gas, improving recovery. Without incentives to use the produced oil and natural gas, it would be considered a waste stream causing much of the oil and natural gas in place to be left in the reservoir.
Orphaned and Abandoned Wells	A well that is not producing or injecting, has not received state approval to remain idle, and for which the operator is unknown or insolvent (IOGCC)
Public Lands Production	"Land owned by the state or federal government." (Williams & Meyers)

Definitions

Regulatory Streamlining	A thoughtful process of making regulations and compliance simpler, saving money for both government and the regulated community, all without decreasing regulatory effectiveness. Streamlining is a constant process that evolves with technology, modernized business practices, government capacity and emerging regulatory needs. (IOGCC)
Resource Management	
Returning Idle Wells to Production	
Services	
Shale Gas	
Site Preparation	Well spacing and site preparation are key in the protection of the natural environment and the protection of correlative rights. Spacing refers to regulatory restrictions of well placement. Site preparation refers to the preparations that operators must make in preparing a site prior to drilling. Incentivizing spacing and site preparation encourages the protection of the natural environment and correlative rights by giving cost and tax benefits that help to ensure the responsible and efficient development of oil and natural gas.
Spacing	See site preparation
Stranded Gas	All oil produced has some gas commingled with the oil. This gas is separated at the well-head. In some cases, the gas can be delivered to natural gas pipelines. In many other cases, the gas is too strong, or too weak, or too little, or too far from a pipeline; this gas is flared, vented, or injected back into the ground. Also known as casinghead gas. (IOGCC)
Temporary Abandonment	Temporary Abandonment -- "Cessation of work on a well pending determination of whether it should be completed as a producer or permanently abandoned." (Williams & Meyers) Idle Well --. (1) A well that is not producing or injecting, and has received state approval to remain idle. or (2) a well that is not producing or injecting, has not received state approval to remain idle, and for which the operator is known or solvent. (IOGCC)
Tight Sands	
Unitization	"A term frequently used interchangeably with pooling but more properly used to denominate the joint operation of all or some portion of a producing reservoir as distinguished from pooling, which term is used to describe the bringing together of small tracts sufficient for the granting of a well permit under applicable spacing rules (Williams, Meyers, Martin, & Kramer, 2006)."
Venting/Flaring of Gas	Venting or flaring of gas cuts down on the costs associated with production. By allowing the venting or flaring of natural gas, states are helping to keep the costs of production down. While venting or flaring is traditionally considered waste, some states will require that royalties be paid on the vented gas after a specified period of venting or flaring. As mentioned above, the use of produced oil or natural gas also limits

Definitions

	venting by encouraging use of oil or gas that would be otherwise wasted in recovery operations. Where recovery operations are not feasible or are cost prohibitive, especially for smaller producers, allowing venting keeps costs down and keeps wells flowing.
Water Management	
Workovers	"Operations on a producing well to restore or increase production" (Williams & Meyers). Reworking and modifying equipment, applying improved processes and methodologies provide an opportunity for increased production, increased efficiencies, and reductions in environmental impact.

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