

# PRODUCE or PLUG?

A Study of Idle Oil and Gas Wells



Interstate Oil and Gas Compact Commission



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## I. EXECUTIVE SUMMARY

The Interstate Oil and Gas Compact Commission (IOGCC) has taken a leadership role on the issue of idle wells. A 1992 study showed the extent of the idle well problem in the United States. The alarming numbers were the impetus for a concerted effort by the states to address this situation. The states have responded with vigor and innovation.

With the guidance of a committee of dedicated state oil and natural gas representatives, the IOGCC updated the study in 1996. Once again the numbers were large, but there also was solid proof that the states recognized the problem and were taking steps to address idle wells.

Now, four years after the 1996 update, this report is presented to keep this important information current. This survey of idle wells reveals that 343,030 wells are idle. Though that figure is an increase of 58,431 over the number reported in 1996, the breakdown of those numbers bears scrutiny. Of those 343,030 idle wells, there are approximately 57,064 idle without state approval, where the operator is either unknown or insolvent. This number of "orphan" wells is a 10 percent decrease from the number reported in 1996. The importance of this decrease must not be overlooked. While the total number of idle wells is up, the growing majority have an identifiable operator.

One of the most important figures to come out of the study is the number of wells each state has on its waiting list of wells to be plugged. As shown in Table II, these are wells waiting to be plugged with state funding. 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 discovered the states are expected to plug 42,403 wells. This is a 12% increase since 1996 and more than a 100% increase since 1992. Some states are showing either a large percentage increase or a large numerical increase. Unfortunately, some states are showing both. Selected examples of the increased burden placed on the states just since the 1996 study show: West Virginia with an increase of 800 wells, (500%); Oklahoma, 565 wells, (291%); California, 335 wells, (231%); Michigan, 146 wells, (52%); Illinois, 1,056 wells, (27%); Louisiana, 286 wells, (10%); and Pennsylvania, 592 wells, (8%). These numbers indicate a growing burden on the budgets of the oil and gas regulatory agencies of each state.

In the tradition of the 1992 and 1996 studies, this updated report by the IOGCC presents policy makers with a comprehensive picture of idle wells under state jurisdiction. In addition to state-by-state statistics, this report carries a separate section with information provided by the U.S. Department of the Interior's Bureau of Land Management (BLM) regarding idle wells on public lands. The BLM is preparing to make an extensive study of idle wells on land it controls.

For the first time, a section with idle well data from the IOGCC international affiliates has been included in the study. A survey and a request for information were sent to the international affiliates. Extensive information was received from Alberta. That data can be found in Section VI. Since the purpose of the study is to inform as well as suggest and discuss solutions, this addition is an important part of the 1999 study because Alberta has an extensive program and strong regulations.

Every well drilled eventually will reach the end of its productive life, at which point plugging is usually the appropriate and environmentally sound action. However, the vast majority of the wells in this survey are idle, not because their resources have been depleted, but because they are unprofitable to operate due to extremely depressed prices during the study period and ever-increasing production and environmental compliance costs. Most do not represent an

environmental threat, and many are potential producers that can provide economic contributions to states and the nation through continued production of domestic oil and gas. Idle wells, if plugged prematurely, could result in the permanent loss of large quantities of domestic oil and gas, which would quickly be replaced by imported oil and gas.

It is difficult to estimate the total production potential from U.S. idle wells and impossible to generalize because there are many states with very different situations. For instance, the average daily marginal oil well production in seven states: (Kentucky, Missouri, New York, Ohio, Pennsylvania, Virginia, and West Virginia) is less than one barrel, while the national average production from marginal wells is 2.07 barrels per day. If all of the nearly 95,000 oil wells that are idle with state approval were returned to production at an average of one barrel per day, it would represent a one percent increase in domestic production.

Six states (Arizona, Illinois, Indiana, Louisiana, New York, and Ohio) have average production from marginal gas wells that is less than 10,000 cubic feet (Mcf) per day, while the national average daily production per marginal gas well is 15.6 Mcf. Assuming gas wells idle with state approval could produce an average of 10 Mcf per day, the resulting increase of 156,000 Mcf per day could be significant for some states.

States have long recognized the economic potential of many idle wells. This study found that more than 167,000 of the nation's idle wells (52 percent) are inactive with the approval of and oversight by state regulators. Through farsighted, flexible regulations, states have acted aggressively with innovative programs that help preserve the integrity of the wellbore — and, therefore, access to the resource — while protecting the environment. For example, many states provide incentives ranging from waiving permit application fees to severance tax exemptions for operators that bring previously idle wells into production.

State programs have had documented successes in returning wells to production. By focusing on long-term benefits rather than short-term tax collections, states are creating new jobs and generating sales tax and royalty payment offsets. Through partnerships with industry and landowners, many idle wells have been returned to production. Still, state statistics show that idle wells account for nearly 24 percent of the unplugged wells (currently producing or idle). Section IV of this report discusses the many incentives in use or under consideration in states.

While many idle wells represent the potential for economic development, others represent potential liability. Orphan wells — those where the operators have gone out of business or are insolvent — represent less than 17 percent of idle wells. Plugging of all the nation's orphan wells would be an extremely large financial burden on the states. The total idle well figure might somewhat understate the problem, since it does not address the fact that many of the existing idle wells might eventually become orphaned, thus increasing the states' plugging liability. Some older producing areas are addressing the idle well problem by significant increases in their state plugging funds. However, many states have programs that stretch plugging funds by identifying and assigning a high priority to problem wells. Section III-C discusses plugging funds and well-plugging authorization in the states. Some states have also initiated an "adopt a well" program to encourage operators to make an effort to bring idle wells into production. Another innovative program is a landowner grant program used in Illinois and Ohio to help landowners plug wells. (See forms from the Ohio program in Appendix C).

There are many recommendations for addressing the idle well problem embodied in the states' oil and gas policy developed by the IOGCC. The focus of this effort is to redirect energy policy to the domestic arena, while addressing the vastly different challenges faced in individual

states. Principal proposals include a heightened research and development effort and the creation of a level field of competition for U.S. energy production. There is a great need for federally funded energy research. New technology may permit the recovery of billions of barrels of oil that would otherwise be left behind.

It is the hope of the IOGCC member states that some day a report on idle wells will be unnecessary. The ultimate goal for states is to have every well produce for as long as possible, while ensuring wells that have outlived their productivity, or are a threat to the environment, are plugged and abandoned.

The IOGCC wishes to express its appreciation to the participating states and the BLM, not only for providing the data that forms the core of this report, but also for their creative efforts to turn many idle wells from liabilities into assets. The IOGCC also acknowledges the input of Alberta. The members of the IOGCC now will be able to see how one of its international affiliates addresses the idle well problem.

## II. INTRODUCTION

In 2000, the IOGCC recognized a need to update the 1996 Idle Well Report. When the original 1992 study was updated in 1996, a committee was selected to produce the new report. This survey was conducted by IOGCC staff. The IOGCC sent out a survey to states, international affiliates, and the Bureau of Land Management. This report is the compilation of the data received.

Although the terminology used by individual states varies, for the purposes of this report, an idle well is defined as:

1. A well that is not producing or injecting, and has received state approval to remain idle (sometimes known as a temporarily abandoned well).
2. A well that is not producing or injecting, has not received state approval to remain idle, and for which the operator is known and solvent.
3. 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 (also known as an orphan well).

The latest questionnaire requested information on a range of topics to provide insights into state programs addressing idle wells and to see what progress has been realized since the 1996 study and if changes have been made. The information obtained from the states falls within the following categories:

- o Statutory authority. All states indicated adequate authority to address idle wells.
- o Security or financial assurance. All but one state with current oil or gas production 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 of oil and gas wells. Current amounts of financial security held by some states may be insufficient to adequately cover the full plugging liability represented by idle wells.
- o Plugging funds. A large percentage of states have established plugging funds to assure that wells for which no or insufficient financial assurance exists are properly plugged and abandoned. Currently, seven states — Kentucky, Kansas, Pennsylvania, Illinois, Louisiana, California, and West Virginia — have at least 1,000 wells each waiting to be plugged with state funds. Nationwide, more than 42,000 wells are waiting to be plugged with state funds.



- ⊆ Approval procedures and technical requirements. Most states require regulatory approval for wells to remain idle beyond an initial short period. This approval is typically based on evidence that the well has future utility. In many states, approval to remain idle must be periodically renewed, and renewal often requires that an integrity test be performed on the well.
- ⊆ Data management and well tracking. Data management capabilities of the states vary, but have an impact on the ability to identify and monitor idle wells. In many states, production and injection reports are evaluated to identify idle wells; other states lack either the authority or the data management capability to use this method.
- ⊆ Salvage value of orphan wells. Most states can salvage any lease equipment or hydrocarbons left in storage tanks on the lease, and use the salvage value to offset the cost of state-funded plugging.
- ⊆ Pre-regulatory wells. Between 828,000 and 1.06 million wells may have been drilled prior to formal regulatory authority being established in producing states. Four states — Kansas, Ohio, Pennsylvania, and Texas — report having more than 100,000 pre-regulatory wells each. Although formal regulatory authority was not established, some requirements did apply to these wells, and most have long ago been plugged and abandoned. With a few exceptions, states now have jurisdiction over these pre-regulatory wells.
- ⊆ Energy and environmental concerns. Wells idle with state approval represent potential production, state revenues, and economic benefits, as demonstrated by the success of programs in Louisiana and Texas. The environmental risk posed by idle wells is variable, based on wellbore and subsurface conditions. Most state programs address this variable risk, and require periodic demonstration of mechanical integrity. The states conclude that idle wells regulated under most current state programs pose minimal environmental risk.

- ⊆ Incentives and innovative programs. Several states have enacted tax incentives to prolong production from marginal (low-volume, marginally profitable) wells, capture the economic benefits of this continued production, and prevent these marginal wells from becoming idle for economic reasons. Several states have also instituted severance tax reductions for idle returned to production. Several states have established innovative programs for the plugging of orphan wells, remediation of orphan sites, and alternative use of non-polluting, mechanically sound wells scheduled for plugging.

<b>Well Category</b>	<b>2000 Study<sup>1</sup></b>
Total wells drilled under state regulation	3,219,701
Producing/injecting wells	1,093,663
Plugged and abandoned wells	1,903,680
Wells converted from producing to Class II Injection wells	128,607
Wells idle with state approval	167,263
Wells idle without state approval, operator known	118,703
Wells idle without state approval, operator unknown or insolvent (orphan)	57,064
<sup>1</sup> Categories do not sum to total wells drilled, see Section III-H for reasons.	

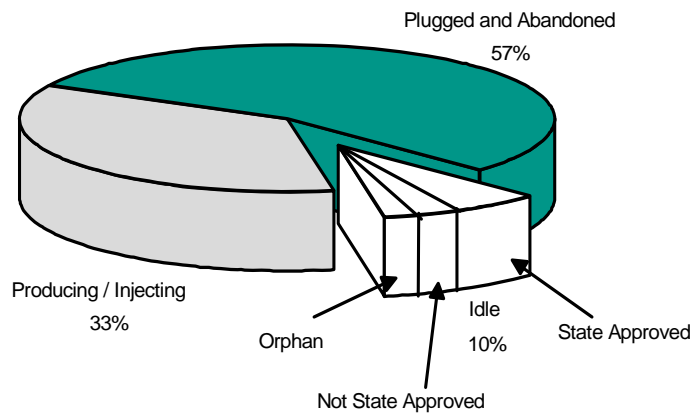
As part of the survey, states were asked

to provide well statistics, including wells currently producing or injecting, wells previously plugged and abandoned, and total wells drilled, as well as the number of wells that fall within the three categories of idle wells described on page 4. These statistics are summarized in the table inset at right. As shown in the pie chart below, of all wells drilled, more than half (57 percent) have been plugged and abandoned. Another 33 percent are still engaged in production of oil and gas, either as producing wells or as injection/disposal wells serving production operations. Only 10 percent of wells are currently idle, including all three categories of idle wells discussed in this report.

Since the 1996 IOGCC idle well report, the reported number of idle wells has increased from 285,000 to 343,030. This is illustrated in the bar chart on this page. The number of reported wells idle with state approval has increased from 150,689 to the 2000 figure of 167,263. Wells idle without state approval, where the operator is known, have also increased from the 1996 figure of 70,472 to 118,703. This figure is a much smaller increase than was seen between the 1992 and the 1996 surveys.

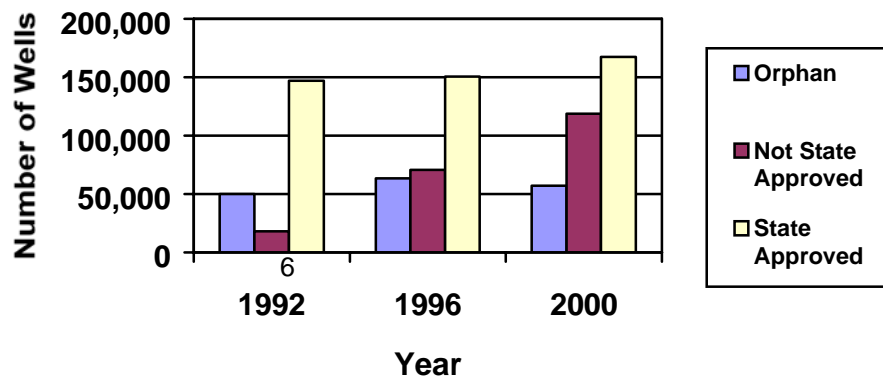
However, perhaps the most revealing statistic is the number of orphan wells. The current figure for wells idle, where the operator is unknown, “orphan wells”, is 57,064. This is a decline of 6,374 wells from the 1996 figure of 63,438. This can be explained by the more aggressive approach the states are taking in identifying a responsible party; classifying; and dealing with the problem of orphan wells.

### Status of Wells Drilled in the U.S.

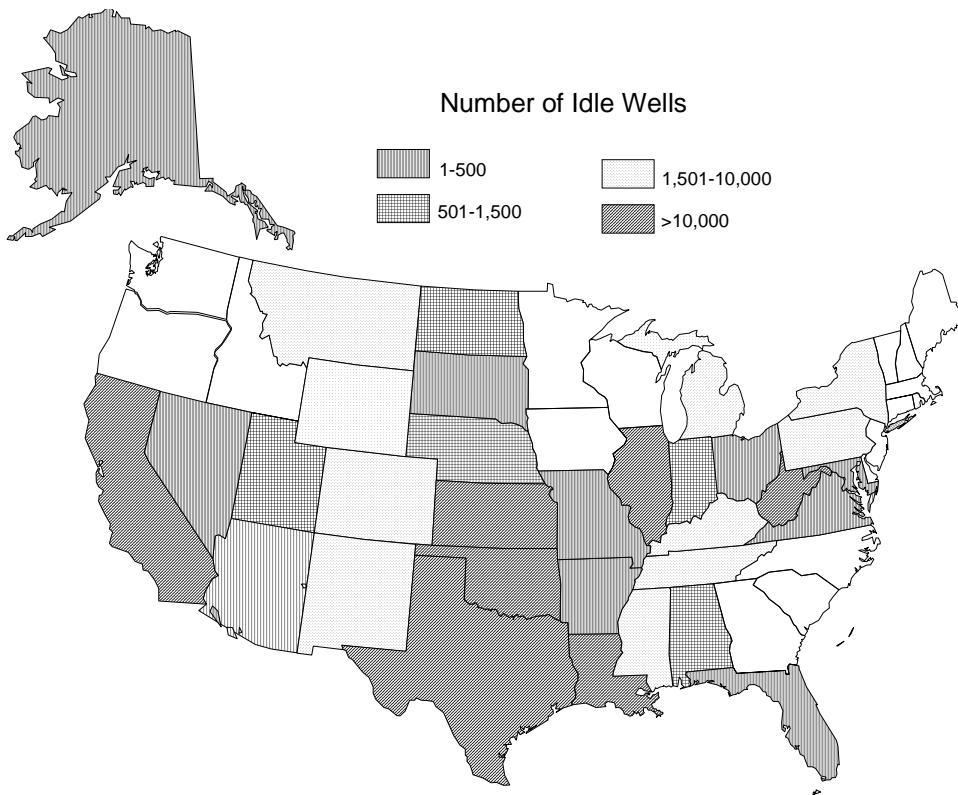


The increases in the other two categories of idle wells contain legally idle wells and wells where a responsible party has been identified. What these figures seem to show is that even though the number of producing wells is declining, most of those wells not plugged and classified as idle, are known to the state regulatory agencies. Readers should be aware that other than idle wells that have received state approval to remain idle; these figures are estimates provided by state personnel based on their knowledge of the industry within their state.

### Status of Idle Wells in the U.S.



## Number of Idle Wells in Oil and Gas Producing States



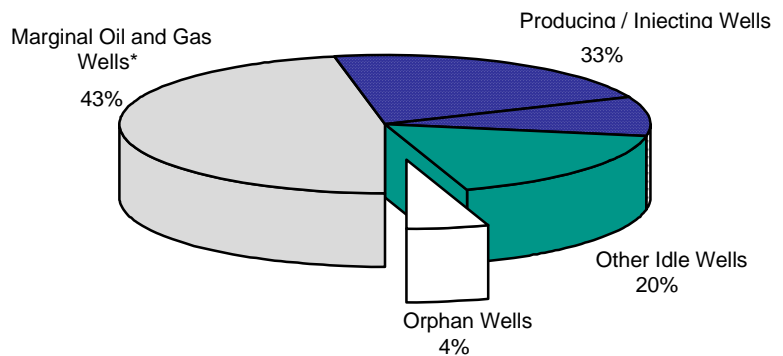
Note: Numbers for Arkansas, Maryland, Tennessee, and Virginia are from the 1996 survey.

Of the 343,030 idle wells throughout the U.S., about 53 percent are idle with state approval. While another 31 percent lack approval, the operator is known and some security for the well exists. The number of orphan wells is only 16 percent of the wells currently idle. This number is a noticeable decrease from the 1996 figure. In 1996, orphan wells were more than 22 percent of the idle wells. The map above illustrates the distribution by state of idle wells (all three categories: idle with state approval; idle without state approval, but operator known; and orphan). Not surprisingly, some of the largest producing states and older producing areas have the largest number of idle wells.

Texas has the largest number of idle wells – 115,557. Other states with more than 10,000 idle wells include: Kansas, 59,956; Louisiana, 34,355; California, 29,129; Oklahoma, 25,978; Illinois, 14,882; and West Virginia, 12,512.

The number of idle wells reported by the states needs to be put into perspective. Most idle wells (with or without state approval), for which a responsible operator is known, have a potential for future use and a party responsible for ultimate

### Orphan Wells are a Small Percentage of Existing Wells



Data for Marginal Wells from: *Marginal Oil and Gas*, IOGCC, 1999.

plugging. These wells represent potential production, plus potential state revenues, employment, and economic activity when they are put back into use. The three categories of idle wells account for approximately 24 percent of the unplugged (currently producing or idle) oil and gas wells in the country.

This report includes both state and federal information. Consequently, it provides the first complete national picture of the idle well issue. It also contains innovative solutions that should be considered by state and federal agencies in their program planning efforts.

The remainder of this report includes sections covering:

- ∪ State summaries of:
  - Statutory authority and definitions.
  - Security or financial assurance.
  - Plugging funds and well plugging authorization.
  - Approval procedures and technical requirements.
  - Data management, well tracking, and inventory methods.
  - Salvage value of orphan wells.
  - Pre-regulatory wells.
  - Idle well statistics.
  - Energy and environmental concerns.
- ∪ Innovative programs, incentives, and new legislation.
- ∪ Bureau of Land Management.
- ∪ International affiliates report.

### III. STATE SUMMARIES

#### A. STATUTORY AUTHORITY AND DEFINITIONS

Statutory authorities and regulatory mechanisms used by states to address idle wells range from those specifically addressing idle wells to those broadly applicable to regulating all oil and gas wells. When the original idle well survey was completed in 1992, states indicated that their existing authorities were generally adequate to address idle wells. In the eight years since that survey, a number of states have updated their definitions and statutory authorities relating to idle wells.

The survey on idle wells requested specific information from the individual states concerning the date of establishment of the state regulatory program, the authorities used to regulate idle oil and gas wells, including statutory authority, statutory or regulatory definitions, and changes or improvements in programs. While the IOGCC provided definitions for “idle wells” for purposes of this study, state definitions vary for wells that might be included in this category. Terminology used by states includes idle, abandoned, temporarily abandoned, inactive, dormant, shut-in, suspended, deserted, and orphaned. A synopsis of state authorities and definitions is included below.

Other agencies involved in the regulation of idle wells are noted. A number of states have Underground Injection Control (UIC) programs administered by the Environmental Protection Agency (EPA), although those are not enumerated. In such cases, idle injection wells used for enhanced oil recovery and water disposal would be under joint jurisdiction with EPA. Additionally, the Bureau of Land Management (BLM) is responsible for wells on federal and Indian lands, although some states share responsibility for these wells with the BLM.

#### State Authorities and Definitions

##### ***Alabama***

Regulation of oil and gas wells in Alabama began in 1945 through legislation establishing the State Oil and Gas Board. The Act provided the Board 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 October 1, 1946, to regulate these activities. Section 9-17-6 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.”

Recent additions and revisions of regulatory statutes include: adoption of new Rule 400-4-5-.04 on March 5, 1999, entitled Protection of Drinking Water Sources During the Hydraulic Fracturing of a Coalbed Methane Gas Well; and revision of Rule 400-4-5-.04 on August 20, 1999, to include a new title, Protection of Underground Sources of Drinking Water during Hydraulic Fracturing of Coal Beds, and additional compliance standards; adoption of an amendment to Rule 400-4-1-.02, Definitions, so as to include Underground Source of Drinking Water (USDW).

Alabama defines an abandoned well as a well that has not been used for six consecutive months and cannot be operated, whether it is a dry hole or

## State Authorities and Definitions

production has ceased, or operations have not been conducted, or for other reasons. A temporarily abandoned well is defined as a well currently not producing oil and/or gas, but it has been approved for future utility by the state supervisor.

Statutory Citation: Authority to Regulate Idle Wells – [§ 9-17-6 of the Code of Alabama].

### **Alaska**

The Alaska Oil and Gas Conservation Commission began its regulation of oil and gas wells on October 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.

The term idle well is not defined or used in Alaska statutes or regulations. Abandoned well is defined as a well plugged in accordance with 20 AAC 25.112, which dictates the setting of subsurface and surface plugs. Alaska does not use the term temporarily abandoned well, but rather uses the terms suspended and shut-in. In Alaska, a suspended well is a well plugged in accordance with 20 AAC 25.110 with a reserved option to re-enter and redrill the well or complete the well. Shut-in is defined as closing a well's surface, wellhead, or subsurface valves to halt flow from or into the well, with the completion interval remaining open to the tubing below the closed valves. The terms suspended and shut in appear in regulations.

Statutory Citation: Authority to Regulate Idle Wells – [31.05.27 and 31.05.030] Abandoned Wells – [20 AAC 25.105].

### **Arizona**

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.

Arizona defines an idle well as a well that is not producing, injecting, or plugged. A temporarily abandoned well is a well that is not producing, injecting, or plugged and may be capable of being put to some future beneficial use. An

## State Authorities and Definitions

abandoned well is a well that is not producing, injecting or plugged and not capable of being put to some future beneficial use.

Statutory Citation: Authority to Regulate Idle Wells – [27-501(21), 27-515, and 27-516]; Plugging oil & gas wells – [27-524(E)]; Plugging and Bonding of Geothermal wells – [27-654(D)]; [A.R.S. 27-516 (A)(1)] -- requires proper drilling, casing, and plugging of wells; [27-516 (A)(3)] -- bonding for oil and gas wells.

### **Arkansas**

Arkansas began the regulation of oil and gas wells in 1939, and its regulations received significant revision in 1983 to include bonding or a letter of credit for security purposes. Plugging and abandonment procedures were enacted in 1939. Protection of ground water also began in 1939. Bonding requirements were reduced in 1995. The Arkansas Oil and Gas Commission is the agency responsible for enforcing these regulations.

The term idle well does not appear in the statutes, rules, or regulations of the state. Arkansas defines an abandoned well as 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. 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.

Statutory Citation: Authority to Regulate Idle Wells – [Act 105 of 1939, Act 902 of 1983, and Act 559 of 1991].

### **California**

In 1915, the State of California began its regulatory program, which included plugging and abandonment procedures. A ground water protection component was added in 1929. In 1931, the first well-bonding requirements were established. In addition, revisions to update/enhance the statutes and regulations have occurred throughout the history of the regulatory program. The California Division of Oil, Gas, and Geothermal Resources is responsible for the maintenance of the regulatory program.

California made major changes to its bonding statutes on January 1, 1999. For individual well bonds, each amount was increased by \$5,000. Amounts are based upon 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.

On January 1, 1999, California changed its definition of idle well. California defines an idle well as any well that has not produced or injected for six consecutive months during the last five years. A long-term idle well has not injected for six consecutive months during the last 10 years. California defines an abandoned well as a well properly plugged, with the site location restored,

## State Authorities and Definitions

and all reports filed.

Statutory Citation: Authority to Regulate Idle Wells – [Public Resources Code (PRC) 3106, 3237, and 3250]; Idle Deserted Wells – [PRC 3237].

### **Colorado**

The Colorado Oil and Gas Conservation Commission (COGCC) began the regulation of oil and gas wells in 1951. Regulation of ground water protection and plugging and abandonment procedures also began in 1951. 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. Additionally, the shooting and chemical treatment of wells, well spacing, and all oil and gas operations so as 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 by the Commission. In 1995, the Commission began requiring mechanical integrity testing on any well idle for more than two years.

Colorado defines a shut-in well as a well which is capable of production or injection by opening valves, activating existing equipment, or supplying a power source. 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 which has been temporarily abandoned for a period of six consecutive months; or any injection well which has not been utilized. An abandoned well is a well that is properly abandoned per COGCC specifications outlined in COGCC Rule 319 a. A temporarily abandoned well is a well which 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. The terms inactive, shut-in and temporarily abandoned wells are defined in the 100 Series Rules, definitions.

Statutory Citation: Authority to Regulate Idle Wells – [C.R.S. 34-60-106 (2)]; Abandonment – [Rule 319 a]; Mechanical Integrity Testing – [Rule 326.b].

### **Florida**

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 also began in 1946. The Florida Geological Survey has responsibility for regulation of oil and gas wells in the



## State Authorities and Definitions

state.

The state defines idle wells as shut-in and temporarily abandoned wells. An abandoned well is a well that has been permanently plugged and abandoned. In Florida, temporarily abandoned wells are wells with existing perforations plugged and which may be re-entered.

Statutory Citation: Authority to Regulate Idle Wells – [Florida Statutes, Chapter 377, Part I and Florida Administrative Code, Rule 62C-26.008].

### **Illinois**

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 the authority to define and regulate idle wells, orphaned wells, and temporarily abandoned wells. While the Act 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 Act, have been in place since the passage of the Act in 1939.

No significant revision occurred to the Act until 1988, at which time 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 the 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 creating the State Plugging and Restoration Program. In 1997, the Act was amended to create the Landowner Grant Program to plug abandoned wells and establish salvage procedures for abandoned production equipment to be used by the Department to offset plugging costs. Over the last nine years, the oil and gas rules have undergone 24 amendments. Major amendments include: revision of temporary abandonment, plugging and mechanical integrity testing rules for Class II wells; a 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.

All idle wells, in accordance with the oil and gas rules, 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, the well, after notice and hearing, is placed into the State Plugging and Restoration Program.

Illinois defines a well as idle if it has been inactive for less than two years and is not required to be temporarily abandoned in accordance with state rules. 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. An

## State Authorities and Definitions

orphaned well is defined by statute as a well that has been inactive for more than two years, does not have a bond or has not paid in accordance with the annual fee assessment, and for which an owner cannot be located or is insolvent.

Statutory Citation: Authority to Regulate Idle Wells – [225 ILCS 725/1].

### **Indiana**

Regulation of oil and gas wells began in 1947. Idle wells are regulated through the Indiana Department of Natural Resources, Division of Oil and Gas. The statutes provide for placing a well in temporary abandoned status, enabling the Division to require (after five years) that wells be plugged, recased, or demonstrate mechanical integrity. 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. This rule also allowed the Division to consider future value of wells in granting a second term of temporary abandonment.

Indiana has no definition for idle well, but defines orphan well as a well that is not producing and for which no financially responsible party exists. Abandoned well is defined as a well that has been permanently plugged. Indiana officially defines a temporarily abandoned well as a well that has approval not to produce oil or natural gas and to delay plugging.

Statutory Citation: Authority to Regulate Idle Wells – [IC 14-37-8-1].

### **Kansas**

Kansas had some plugging authority in place in 1933. However, for practical purposes, the 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. These regulations were enforced by the Kansas Department of Health and Environment through 1986, and by the Kansas Corporation Commission 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 by statute and went into effect on January 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 towards any party that has had physical control of the well during its existence. On February 4, 1999, the KCC issued a special declaratory order clarifying and focusing filing requirements for temporary abandoned wells. The order excluded wells from the temporary abandonment application filing process which met the following criteria:

- a. Fully equipped for production of oil or gas, or injection.

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- b. Capable of immediately resuming production or 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 Commission rules and regulations.

This order was issued in response to low oil prices and the large numbers of temporarily abandoned wells.

The Kansas Corporation Commission views an idle well as any well not in operation or service because of a correctable malfunction or operator choice. The idle well category would include temporary abandoned wells, shut-in wells, and abandoned wells. An abandoned well is viewed as any well which has not been properly plugged under regulation where there is no identifiable owner / licensed operator responsible for the care and control of the well. This designation would be comparable to other states' definitions of an orphaned well. A temporarily abandoned well is one which has been inactive for more than 90 days and which is temporarily abandoned by the operator of record. Such wells are eligible for temporary abandonment status upon the filing of a temporary abandonment application with the Commission. The term shut-in well refers to wells in a state of nonproduction or service because of: 1) the lack of a pipeline connection; 2) shut-in order issued by the Commission against a well for noncompliance with Commission regulations; or 3) the necessity to bring a well into compliance with an existing proration order. With the exception of the term "shut-in well," these terms are contained in both statutes and regulations.

Statutory Citation: Authority to Regulate Idle Wells – [Chapter 55].

### ***Kentucky***

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 non-coal-bearing strata and coal-bearing strata. Bonding requirements and penalty provisions were established in 1966 and increased in 1990.

Kentucky defines an idle well as a well that is equipped but not in production. A temporarily abandoned well is defined as a well shut down for good cause as determined by the state and an improperly abandoned well is defined as a well that is neither producing nor plugged. Although these terms appear in Kentucky statutes and regulations, they are not defined by law.

Statutory Citation: Authority to Regulate Idle Wells – [Kentucky Revised

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Statutes, Chapter 353.510, 353.550, 353.560].

### **Louisiana**

Act 127, passed in 1912, gave the Louisiana Commission for the Conservation of Natural Resources the authority to regulate the plugging of abandoned wells. The Louisiana Department of Conservation was created in 1916. Act 133 of 1924 made it illegal to pollute the waterways with salt water, oil and other substances. In 1940, Act 157 was promulgated and was adopted as Title 30 of the Revised Statutes of 1950. Statewide Order No. 29-B was first promulgated in 1943. 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 were promulgated in 1980. In 1986, the first oil field pit rules were added. Regulation of idle wells is accomplished through 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.

Louisiana has no official definition for idle well, or temporarily abandoned well. Inactive well is used instead of the term idle well. Abandoned well is defined as a well 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. The terms abandoned well and temporary abandoned well appear in Title 43 of the Louisiana statutes.

Statutory Citation: Authority to Regulate Idle Wells – [LSA-R.S. 30:4 and Statewide Order No. 29-B § XIX]; Plugging Fund – [Act 404 of 1993 as amended by Act 297 of 1995].

### **Maryland**

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. Maryland does not regulate idle wells.

Maryland uses the term shut-in well to define an idle well. Maryland statutes contain the term abandoned well. In Maryland, 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.

Statutory Citation: Authority to Regulate Idle Wells – [Environment Article §14-103 Code of Maryland Regulations 08.10.01.06 B].

### **Michigan**

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, now located in the Geological Survey Division of the Department of Environmental Quality. The Act also required casing and sealing of each freshwater, brine, oil or gas formation. Plugging requirements were also

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introduced in 1927. Specific regulations concerning the power to regulate 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 by such methods and means that no unnecessary damage to underground resources, neighboring properties, or rights to life will result. In 1994, Michigan passed legislation creating an orphan well fund and providing the Supervisor with the authority to use the fund for plugging, response activity, or site restoration at orphaned oil or gas wells. In 1996, Michigan changed the bond amounts: \$10,000–\$30,000 for an individual well; and \$100,000–\$250,000 blanket bond for multiple wells (up to 100).

A shut-in is defined as an action by a permit holder to close a producing well, a well capable of producing, or an injection well temporarily and for specific reasons. An abandoned oil or gas well means an oil or gas 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, unless the Supervisor has authorized it to remain idle. A temporarily abandoned well is defined as a well that has received permission from the Supervisor of Wells to remain unplugged for more than 12 consecutive months. 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 well. Shut-in and abandoned are defined in regulations.

Statutory Citation: Authority to Regulate Idle Wells -- [Part 615 (Supervisor of Wells) and Part 616 (Orphan Well Fund) of Act 451 of 1994, as amended].

### **Mississippi**

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, initially adopted in 1948, were revised in 1981. Ground water protection rules, initially adopted in 1948, were revised in 1981 and 1989. Requirements for the financial responsibility of operators were established in 1992.

Mississippi defines an idle well as a production well that is shut-in at the surface, but can be placed back into production by its current operator. An abandoned well is defined in Mississippi as an unplugged shut-in production well in which no reports are being submitted by a responsible party. In Mississippi, a temporarily abandoned well is a well in which a temporary or permanent plug has been put in place to isolate the productive interval from shallower zones. None of these definitions is found in either Mississippi statutes or regulations.

Statutory Citation: Authority to Regulate Idle Wells – [Mississippi Code, §

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53-1-17]; Idle Well Definitions – [Oil and Gas Board Rule 28].

### **Missouri**

Missouri began the regulation of oil and gas wells in 1966. Regulations for ground water protection, plugging and abandonment, and bonding were also established in 1966 and have since been revised on several occasions. Regulation is accomplished through the Division of Geology and Land Survey under the Department of Natural Resources.

A temporarily abandoned well is a well 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. An abandoned well is defined as a well with a permanent plug in accordance with the oil and gas regulations. Missouri has no definition for idle well.

Statutory Citation: Authority to Regulate Idle Wells – [Missouri RSMo. Chapter 259].

### **Montana**

The regulation of oil and gas wells in Montana began in 1954. Bonding requirements were increased in 1993. The 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. Montana has applied to EPA for primacy to regulate its Class II injection wells.

No definitions are established for the terms “idle well,” “abandoned well,” or “temporarily abandoned well.”

Statutory Citation: Authority to Regulate Idle Wells – [82-11-111].

### **Nebraska**

The Oil and Gas Conservation Act for the regulation of oil and gas was adopted on September 28, 1959. However, the first regulations that gave authority to the Nebraska Geological Survey were adopted in 1940 and updated in 1956. § 57-905(3)© of the Nebraska Revised Statutes gives the Oil and Gas Conservation Commission the authority to require drilling, casing, operating, and plugging of wells in such a manner as 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.

Though Nebraska does not define idle well, abandoned well, or temporarily abandoned well, the state defines an inactive well as either shut-in or temporarily abandoned.

Statutory Citation: Authority to Regulate Idle Wells – [Revised Statutes, § 57-905(3)© and Title 267, Chapter 3-040 of the rules and regulations].

### **Nevada**

Regulation of the Nevada oil and gas industry began in March, 1954. 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

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was changed to the Division of Minerals under the Nevada Department of Business and Industry. Ground water protection and plugging and abandonment procedures began in 1954. The oil and gas regulations have been amended in 1976, 1987, and 1994. The Division of Minerals has the authority to require the plugging of wells so as 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 went under reorganization changes again, and is now under 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." It is the policy of the Division of Minerals that the operator be required to conduct a well inspection to determine the integrity of the well head, etc., prior to the extension request being granted by the administrator.

In Nevada a well is classified as an abandoned when production of oil/gas has ceased from the well and the well becomes unprofitable. Nevada considers a temporarily abandoned well as a well that has been shut in but not plugged. Nevada considers a well to be shut in when the valves are closed and the well stops producing.

Statutory Citation: Authority to Regulate Idle Wells – [NRS 522.040]; Idle Well Definitions – [Rules of Practice and Procedure, 522.430].

### ***New Mexico***

The New Mexico Oil Conservation Commission was created in 1935 and empowered to promulgate regulations to protect ground water by plugging and abandonment. Specific to plugging and abandonment and ground water protection, 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 the disposition of salvageable equipment and material removed from wells being plugged by the state. 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.

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. A shut-in well is defined as a production or injection well that is temporarily closed down, whether by closing a

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valve or disconnection or other physical means. An abandoned well is an inactive well with either an unknown or an insolvent operator. 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.

Statutory Citation: Authority to Regulate Idle Wells – [NMSA 1978, § 70-2-12.B (1); NMSA 1978, § 70-2-14].

### ***New York***

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. The rules and regulations also make it unlawful to shut-in or temporarily abandon a well for more than one year or 90 days respectively, without Department approval.

A shut-in well is defined as a well capable of production that is closed down temporarily for repairs, testing, or lack of market. A temporarily abandoned well is one in which operations have been discontinued or the well has been closed in without plugging and abandonment operations. An abandoned well is defined as any unplugged well shut in for more than one year without Department approval and whose ownership may or may not be known.

Statutory Citation: Authority to Regulate Idle Wells – [Environmental Conservation Law, Article 23-0805 (8)(E) and Chapter 959, Article 3-A of 1963]; Plugging and Abandonment – [Chapter 64 of 1882 and Rules and Regulations, Parts 555.2 and 555.3].

### ***North Dakota***

Oil conservation laws and rules were enacted in 1941, although oil itself 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 the regulation of idle wells.

In North Dakota, an abandoned well is one which has had equipment removed, or has failed to produce oil or gas for a period of one year. This is defined by the NDAC 43-02-03-55. A temporarily abandoned well is defined as a well that upon application the Director may approve, with stipulations, temporary abandoned status for one year. This is defined in NDAC 43-02-03-55. North Dakota does not use the term idle well, but, as stated, the terms abandoned well and temporarily abandoned well appear in the rules of the NDAC. The North Dakota Century Code gives the North Dakota Industrial Commission



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authority over oil and gas wells which are idle.

Statutory Citation: Authority to Regulate Idle Wells – [North Dakota Century Code, § 38-08-04.(2)]; Idle Well Definitions – [North Dakota Administrative Code 43-02-03-55].

### **Ohio**

Regulatory authority was established with the creation of the Division of Oil and Gas in 1965. However, in 1883, the first oil and gas law was enacted regulating 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 also 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, in 1974; permit issuance, well construction and monitoring and reporting requirements, in 1982; the elimination of brine storage pits and the establishment of standards to define contamination of water supplies, in 1985; the amendment of annular disposal rules, in 1990; the establishment of the Orphan Well Landowner Grant Program, in 1995; and multiple rule changes in 1998. According to § 1509.12 of the Ohio Revised Code, the Chief shall order any well that is incapable of production in commercial quantities to be plugged unless written permission is granted.

An idle well is defined as a well incapable of production. Ohio defines an abandoned well as a well that has been deserted without being properly plugged. A temporarily abandoned well is a well for which permission has been given to delay plugging. These definitions do not appear in either Ohio statutes or regulations.

Statutory Citation: Authority to Regulate Idle Wells – [Chapter 1509.12 of the Ohio Revised Code].

### **Oklahoma**

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 plugging and abandonment procedures began in 1917. In 1965, Oklahoma passed the Well Plugging Act. In Oklahoma, the Corporation Commission has sole and exclusive authority to regulate oil and gas activities, but may not issue informal policies.

Oil and Gas Division policy defines an idle well as a well that has been drilled since regulation began, is not currently producing or injecting, and meets one of the following criteria: 1) has received regulatory approval to remain idle or temporarily abandoned; 2) has not received regulatory approval to remain idle or temporarily abandoned and has a known and solvent operator; or 3) has not received regulatory approval to remain idle or temporarily abandoned and has an unknown or insolvent operator. The Oklahoma Corporation Commission

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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 2.a. 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 b. 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.” Thus, the legislature has provided some guidance to the Commission on which wells it considers to be abandoned while providing the Commission latitude to determine a well’s status. The 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 165:10-11-3 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 surface cased only well be plugged within 90 days after completion of drilling or testing, and a well with surface casing only be plugged within 90 days after completion 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. The abandonment is valid for two years with extensions available for good cause shown. Wells granted temporary exemption from plugging are considered “temporarily abandoned wells” in Oklahoma.

Statutory Citation: Authority to Regulate Idle Wells – [Title 52 O.S., § 139]; Plugging and Abandonment – [OAC 165: 10-11-9 and OAC 165: 10-11-3].

### ***Pennsylvania***

The Bureau of Oil and Gas Management was given responsibility for oil and gas regulation in 1955. Since the 1890s there has been legislation requiring nonproducing wells to be plugged to protect the formation. Legislation in 1984 updated plugging requirements to include environmental considerations, require bonding, and allow for a specified period of approved nonproduction before the well must be plugged. Act 57 of November 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. No new eligibility for Phased Deposit bonding. Fee in lieu of bonding eliminated for pre-act wells.

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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. 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.

Statutory Citation: Authority to Regulate Idle Wells – [P.L 1140, No. 223; 58 P.S. § 601.204]; Idle Well Policies – [Chapter 78 of Department’s Rules and Regulations].

### **South Dakota**

The regulation of oil and gas wells in South Dakota began in 1939. Ground water protection and plugging and abandonment regulations began 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 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.

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 operator is granted an extension by the Secretary. South Dakota has no definition for idle well or abandoned well.

Statutory Citation: Authority to Regulate Idle Wells – [SDCL 45-9-11]; Idle Well Definitions – [Rule: ARSD 74:10:04:03].

### **Tennessee**

Regulation of oil and gas wells, including plugging and abandonment procedures, began in 1972. Ground water protection rules also came into place in 1972. 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 the regulation of idle wells.

There is no official definition for idle well, abandoned well, or temporarily 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.

Statutory Citation: Temporarily Abandoned Well – [1040-2-2-.02(3) and

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1040-4-2-.10].

### **Texas**

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 initiated in 1919. Plugging and abandonment procedures also were initiated through Statewide Rules 10(b), 13 and 23 on October 17, 1933. Chapter 89 of the Texas Oil and Gas Conservation Laws and Statewide Rule 14 give the Commission authority to require the plugging of abandoned oil and gas wells. The Commission was given authority 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 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 initiated in 1983, 1991, and 1995.

No state definition is in place for an idle 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. A temporarily abandoned well is defined as a well that is currently not in service.

Statutory Citation: Authority to Regulate Idle Wells – [Texas Oil and Gas Conservation Laws, Chapter 89 and Statewide Rule 14].

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### Utah

Regulation of oil and gas in Utah began in 1955, including regulations for ground water protection and for 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. The Division prepared and distributed an Environmental Handbook for the oil and gas exploration and production (E&P) industry in 1996. 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.

In Utah, idle well is defined as any well, whether oil or gas or injection which does not produce or inject fluids during a calendar month. The term is used synonymously with “shut-in well” which means a well that is completed, is shown to be capable of production in paying quantities, and is not presently being operated. There is no current 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. A temporarily abandoned well is a well that has been completed, is not shown capable of production in paying quantities, and is not presently being operated. The listed definitions for idle well and temporarily abandoned well are included in the Oil and Gas Conservation General Rules for the Utah Board of Oil, Gas and Mining and the Division of Oil, Gas and Mining.

Statutory Citation: Authority to Regulate Idle Wells – [Utah Code Annotated, § 40-6-1 et. Seq.].

### Virginia

Statutory standards were first enacted by Virginia in 1948. The regulatory program began in 1950, along with the creation of the Oil and Gas Board. The Department of Mines Minerals and Energy was created in 1985. The Virginia Statutes give specific authorities for the abandonment or cessation of a well and the orphan well program. Specific protection for ground water and plugging and abandonment procedures were established in 1950. The Virginia Gas and Oil Act was passed in 1990, and subsequent regulations were finalized in 1991. These were revised in November, 1998.

No definitions are provided for an idle well, or temporarily abandoned well. However, the terms “abandonment of a well” and “cessation of well operations” mean the time at which: (1) a gas or oil operator has ceased operation of a well and has not properly plugged the well and reclaimed the site as required by this chapter; (2) the time at which a gas or oil operator has allowed a well to become

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incapable of production or conversion to another type; or (3) the time at which the Director revokes a permit or forfeits a bond covering a gas or oil operation. The statutes define 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.

Statutory Citation: Authority to Regulate Idle Wells, Orphan Well Fund, Gas and Oil Restoration Fund – [§ 45.1-361.34].

### **West Virginia**

West Virginia initiated regulating oil and gas operations in 1929. These regulations included plugging and abandonment procedures. Ground water protection legislation passed in 1969 was revised in 1991. The West Virginia Abandoned Well Act was passed in 1992. It 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 the regulation of idle wells.

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. 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. West Virginia also 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.

Statutory Citation: Authority to Regulate Idle Wells – [West Virginia Code 22-6 and 22-10]; Idle Well Definitions – [WV Code 22-6-19 and 22-10, State Regulations 35-5 and 35-6, and 40 CFR 146.3].

### **Wyoming**

Regulation of oil and gas wells and plugging and abandonment procedures under the current Wyoming program began on August 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 § 30-5-104 created the Oil and Gas Conservation Commission with 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, and 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

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bond. Regulation for ground water protection began on April 16, 1981. Bonding levels for wells on State of 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.

Wyoming defines a shut-in well as a well not currently considered active in which the completion interval has not been isolated from the wellbore above and where the wellbore condition is such that its utility may be restored by opening valves or by energizing equipment involved in operating the well. A dormant well is a well that is no longer actively producing, monitoring, or injecting, or which does not qualify as a permanently abandoned, shut-in, or temporarily abandoned. A permanently abandoned well shall mean a well which 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 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. These definitions appear in Wyoming regulations.

Statutory Citation: Authority to Regulate Idle Wells – [§ 30-5-104 and Rules 304, 315, and 316].

## B. 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. Many states have made recent changes to upgrade their security and financial assurance requirements; some have begun to charge annual fees in lieu of, or in addition to, routine security or 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 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.

<b>Types of Financial Assurance</b>	
	Number of States Allowing
Surety bond	30
Certificate of deposit	27
Cash	26
Letter of credit	17
Financial statement	7
Fee in lieu of bond	2
First lien on well equipment	2
Negotiable U.S. bonds	1
Cashier's check	1
Consolidated investment fund	1
Phased deposit fund	1
Minerals trust fund	1
Security interest in property	1

All states with current oil or gas production, except Louisiana, require some form of security or financial assurance. However, certain classes of wells in some states are exempt from financial security requirements. Of the 31 states requiring security, 30 allow surety bonds, 27 allow the use of certificates of deposit, 26 allow cash, and 17 allow the use of a letter of credit. Several states also allow other forms of security. For example, Utah allows the acceptance of negotiable U.S. bonds. Colorado allows the acceptance of a security interest in real or personal property as assurance. Texas will accept the first lien on salvageable equipment when its value is greater than the security amount required. West Virginia allows the use of a consolidated investment fund, which is a state-operated investment fund. Louisiana statutes provide authority for the Commissioner of Conservation to promulgate bonding rules and regulations. The requirement of some form of security or financial assurance is presently under

consideration in Louisiana. Laws have been proposed for the Louisiana Legislature's review.

The costs of plugging and site restoration intended to be covered by security can vary by well depth and geographic location. Reflecting these differences, single well bonds range from \$500 for wells 500 feet deep or less in Kentucky, to a minimum of \$100,000 per well in Alaska. Fourteen states set the security amount by depth (Alabama, Arizona, California, Illinois, Kansas, Kentucky, Michigan, Mississippi, Missouri, Montana, New Mexico, New York, Utah, and Wyoming). The amounts for single well bonds in Oklahoma are established by a licensed plugger (pluggers who are permitted to bid on state plugging contracts are licensed by the Corporation Commission after reviewing their qualifications), although the blanket bond is a set dollar amount. Generally, the required amount of a blanket bond is between \$10,000 and \$100,000, but the amounts vary greatly among the states. The required amounts for blanket bonds range from as low as \$5,000 in Kansas (for 1–5 wells with a depth of less than 2,000 feet); to a \$200,000 minimum in Alaska; a \$500,000 maximum in Maryland; and as high as \$1 million in California.



Though most states require security or financial assurance, some states, such as New York, do not require security on pre-regulatory wells, while other states may have inadequate levels of financial assurance to cover plugging costs. Blanket bonds are sometimes inadequate to properly plug all of an operator's wells.

Of the states that require bonds, California and Illinois do not maintain their individual bonds for the life of the well — rather, they are completion bonds. The bonds in California are released after a successful completion, which is defined as six months continuous production or approved plugging and abandonment; therefore, many wells in that state are not covered by current well bonds. Bonds are held in Illinois for two years. At that time, if the operator is not in violation of the Illinois Oil and Gas Act, the bond is released and the operator is required to contribute an annual fee (based on the total number of wells owned by the operator) to the state plugging fund. Failure to pay the fee results in an order to halt all production of that operator. In addition to the routine security requirements, eight states have developed programs that merit discussion. They are as follows:

**California** Beginning January 1, 1999, unless an operator has a \$1 million “super” blanket bond or individual bond, he must do one of the following for each idle well: pay a fee; post a bond; file an escrow account; or file an Idle Well Management Plan.

**Florida** The Petroleum Exploration and Production Bond trust fund is a mechanism for operators to obtain coverage if they are unable to obtain coverage elsewhere. The single well charge is \$5,397 for the first year, and \$2,024 thereafter. The blanket bond charge is \$40,479.

**Kansas** In addition to the more traditional forms of security, the Kansas Corporation Commission will suspend or revoke an operator's license. This measure causes the shut down of production until compliance with regulations is restored. Under the existing financial assurance program, revenues from non-refundable fees are generated at the current rate of approximately \$150,000 per year. Legislation contemplated for the 2000 legislative session would earmark those monies to accrue with interest in a fund dedicated to pay for plugging costs associated with orphaned wells not covered by the existing Abandoned Well / Site Reclamation Fund, i.e. wells drilled after July 1, 1996.

**Michigan** In Michigan, no bonding amounts are reduced or released prior to the approved plugging of a well. However, a well may be drilled to total depth under a bond amount equal to one half the required amount. For example, a well permitted to a total depth of less than 2,000 feet may be drilled under a \$5,000 bond. Commencement of well completion operations requires submittal of the remaining amount. This option is limited to five permits per permittee at any one time.

**Pennsylvania** Act 57 of 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. There is no new eligibility for Phased Deposit bonding. The state no longer accepts a fee in lieu of bonding for pre-

regulatory wells.

**South Dakota**

SDCL 45-9-15 states that a Surface Restoration Bond is required when the landowner or lessee is not a party to the oil and gas leasing agreement.

**Texas**

To slow the growth in the number of abandoned wells and other oil field sites that must be addressed with state funds, S.B. 1103 of 1991 established new financial responsibility requirements for oil and gas operators. Anyone conducting oil and gas operations regulated by the Railroad Commission must file an annual organization report and submit a bond or alternate form of financial security. This financial security covers all of the operator's oil and gas operations regulated by the Commission. S.B. 1103 gives an operator the choice of several methods of satisfying this requirement. The options are:

- 1) If the operator's only operations are wells, a bond in an amount equal to \$2 per foot of the aggregate total depth of all the operator's wells
- 2) A blanket bond in an amount equal to:
  - a) \$25,000 if the operator has 10 or fewer wells or has no wells but performs other operations;
  - b) \$50,000 if the operator has 11 to 99 wells; or
  - c) \$250,000 if the operator has 100 or more wells
- 3) If the operator can demonstrate an acceptable record of compliance with the Commission's safety and pollution prevention rules during the previous 48 months, an annual fee of \$100
- 4) An annual fee of three percent of the amount of the bond that would otherwise be required
- 5) A first lien on oil field equipment with a salvage value equal to the amount of the bond that would otherwise be required.

If an operator chooses to pay a fee or file a lien, rather than file a bond, the operator must also pay a fee of \$100 with each application for an extension of time to plug an inactive well.

In 1995, the Texas Legislature passed H.B. 1407, a companion to S.B. 1103, as an incentive for further compliance. H.B. 1407 requires the Commission to set a company to non-compliant status when outstanding violations of safety or pollution prevention rules exist. This bill also provides for "tainted" companies (companies that have a common officer on their annual Organization Report with the non-compliant company) to also have their status set to non-compliant. The time frame for non-compliant status is five years from the next organization report filing after the "law date." The "law date" is the date after all appeals of a violation have been exhausted. As long as an organization report shows non-compliant status, the commission is required to reject any and all new permit applications and disapprove any lease transfer applications.

**Wyoming**

In 1995, Chapter 3, § 4 was amended to increase the bonding requirement for wells which are not producing, monitoring, injecting,

permanently abandoned, shut-in, or temporarily abandoned from \$2.00 to \$3.00 per foot of depth. Additional bonding may be required as soon as an operator's total footage of dormant wells exceeds 8,300 feet.

The majority of states permit the regulatory agency to change the bond amount by regulation. In New Mexico and Oklahoma, that authority is limited with flexibility on individual wells or within a range set by the legislature. The bond amounts in California, Indiana, Kansas, Kentucky, New York, Texas, Virginia, and West Virginia are established solely by the state legislature.

A number of states either require filing a separate security or financial assurance for site restoration, or restoration is included in the plugging bond. The states of Alabama, Arizona, Florida, New York, Pennsylvania, and Utah cover site restoration as an obligation of the bond. Amounts for site restoration range from \$1,500 per well in Tennessee, to \$100,000 per lease in Alaska.

Some states have the authority to either place a lien on the surface equipment of a well if the operator fails to comply with the plugging regulations, or become the owner of the equipment. Arizona, California, Illinois, Nebraska, Oklahoma, and Pennsylvania may file liens on abandoned equipment. In Kentucky, the state claims the property unless it is claimed by the lessor, or someone with evidence of title other than the operator, although no liens can be filed. In Louisiana, prior to a sheriff's sale, the Commissioner of Conservation is notified, if appropriate, and that official may place a lien that can follow to a third party. No lien authority exists in Michigan although, in practice, the contractor removes the equipment as part of the cleanup, and may dispose of the equipment and credit the state for the value of the salvage. Following a hearing, equipment in North Dakota may be confiscated after a well is plugged. In West Virginia, the party conducting the plugging operations or the surface owner may take the equipment.

Once a state determines that it has the responsibility to plug a well, various obstacles have been encountered along the path to closure. These obstacles may include: state procurement procedures, which make it difficult and time-consuming to obtain bids; resistance of landowners; limited access to the wellbore; and inability to quickly obtain funds from securities. A complete list of plugging and restoration bond amounts follows as Table I.

**Table I. State Security or Financial Assurance Requirements**

State	Security First Required/ Last Modification	Securities Permitted	Security for Single Wells	Blanket Bond	Can Regulatory Authority Alter Amount?	Separate Site Restoration Bond?	Amount / Conditions
Alabama	1945/1976	Surety	\$5,000 to \$50,000 based on depth	\$100,000	YES	NO	Included in plugging bond
Alaska	1958/1999	Surety, CD, Letter of Credit	\$100,000 minimum	\$200,000 minimum	YES	YES	Single well bonds allowed for estimated cost of P&A if less than \$100,000
Arizona	1959/1994	Cash, surety, CD	\$10,000 (<10,000 ft) \$20,000 (>10,000 ft)	\$25,000	YES	YES	Can be required on state leases
Arkansas	1983/1999	Cash, surety, CD, Letter of credit	\$3,000	As approved by Commissioners	YES	NO	N/A
California	1931/1999	Cash, surety, CD	\$15,000 (<5,000 ft) \$20,000 (>5,000 ft and <10,000 ft) \$30,000 (>10,000 ft)	\$100,000 (<50 wells) \$250,000 (>50 wells) \$1 million (covers all wells)	NO	NO	N/A
Colorado	1951/1994	Cash, surety, CD, Financial statements, Certificate of insurance, escrow account, sinking fund lien, security interest in real or personal property	\$5,000	\$30,000 (<100 wells) \$100,000 (>100 wells)	YES	YES	For surface: \$ 2,000 for non-irrigated land and \$5,000 for irrigated, or \$25,000 state-wide blanket financial assurance
Florida	1946/1999	Cash, surety, CD, Minerals trust fund	\$50,000, \$100,000 Petroleum E&P Bond Trust Fund \$5,397 first year; \$2,024 per year after	\$40,479	YES adjusted on July 1 of every odd year	NO	Included in plugging

**Table I. State Security or Financial Assurance Requirements (Continued)**

State	Security First Required/ Last Modification	Securities Permitted	Security for Single Wells	Blanket Bond	Can Regulatory Authority Alter Amount?	Separate Site Restoration Bond?	Amount / Conditions
Illinois	1939/1995	Surety, CD, financial statement, Irrevocable letter of credit Security is now only required for new operators, and must be maintained for two years; released, and operator responsible for annual fee.	\$1,500 (<2,000 ft) \$3,000 (>2,000 ft)	\$25,000 (0–25 wells) \$50,000 (26–50 wells) \$100,000 (>50 wells)	YES	NO	N/A
Indiana	1947/1985	Cash, bond, CD	\$2,000	\$30,000	NO	NO	N/A
Kansas	1982/1998	Cash, surety, CD, Financial statement, Letter of credit, first lien on equipment	\$0.75 per foot for all wells	Wells < 2,000 ft: 1–5 = \$5,000 6–25 = \$10,000 > 25 = \$20,000 Wells > 2,000 ft. 1–5 = \$10,000 6–25 = \$20,000 > 25 = \$30,000	NO	NO	N/A
Kentucky	1966/1990	Cash, surety, CD, Letter of Credit	\$1 per foot; \$500 increments	\$10,000	NO	NO	N/A
Louisiana	None	N/A	N/A	N/A	N/A	N/A	N/A
Maryland <sup>1</sup>	1957/1995	Cash, surety, CD, Letter of Credit	\$100,000 maximum	\$500,000 maximum	YES	NO	N/A

**Table I. State Security or Financial Assurance Requirements (Continued)**

State	Security First Required/ Last Modification	Securities Permitted	Security for Single Wells	Blanket Bond	Can Regulatory Authority Alter Amount?	Separate Site Restoration Bond?	Amount / Conditions
Michigan	1931/1996	Cash, surety, CD, Financial statement, Letter of Credit	\$10,000 (0-2,000 ft) \$20,000 (2,000-4,000 ft) \$25,000 (4,000-7,500 ft) \$30,000 (>7,500 ft)	\$100,000 (maximum of 100 wells up to 2,000 ft) \$200,000 (maximum of 100 wells 2,000- 4,000 ft) \$250,000 (unlimited wells)	NO	NO	One conformance bond covers all
Mississippi	1992/1998	Cash, surety, Letter of Credit	For cash, 5% of single well bond amount. For surety & Letter of Credit: \$10,000 (0-10,000 ft) \$15,000 (10,001-16,000 ft) \$30,000 (16,001-20,000 ft) \$50,000 (>20,000 ft)	For surety and Letter of Credit, \$100,000	YES	NO	N/A
Missouri	1966/1989	Surety, CD, letter of credit	\$1,000 (0–500 ft) \$2,000 (501–1,000 ft) \$3,000 (1,001–2,000 ft) \$4,000 (2,001–5,000 ft) \$4,000 + \$1 per foot (>5,101 ft)	\$20,000 (0–800 ft) for maximum of 50 wells \$30,000 (801–1,200 ft) for maximum of 15 wells	YES	NO	N/A
Montana	1954/1998	Surety, CD, will rarely accept a financial statement	\$5,000 (<3,500 ft) \$10,000 (>3,500 ft)	\$50,000	YES	NO	N/A
Nebraska	1959/1984	Cash, surety, CD	\$5,000	\$25,000	YES	NO	N/A
Nevada	1954/1976	Cash, surety, CD	\$10,000	\$50,000	YES	NO	N/A
New Mexico	1935/2000	Cash, surety, CD, letter of credit	\$5,000 (<5,000 ft) \$7,500 (5,000–10,000 ft) \$10,000 (>10,000 ft)	\$50,000	YES Can set amounts for individual bonds but not blanket bonds	YES	State Land Office does require for state leases

**Table I. State Security or Financial Assurance Requirements (Continued)**

State	Security First Required/ Last Modification	Securities Permitted	Security for Single Wells	Blanket Bond	Can Regulatory Authority Alter Amount?	Separate Site Restoration Bond?	Amount / Conditions
New York	1963/1985	Cash, surety, CD, letter of credit	\$2,500 (<2,500 ft) \$5,000 (2,500–6,000 ft) >6,000 ft, anticipated plugging costs	\$25,000 to \$100,000 \$40,000 to \$150,000	NO	NO	Security covers plugging & restoration
North Dakota	1941/1983	Cash, surety	\$15,000 Commercial disposal wells must single well bond	\$50,000 (10 wells) For cash & surety bond: \$100,000 (10 unplugged or abandoned well limit)	YES	NO	N/A
Ohio	1963/1999	Cash, surety, CD, financial statement, Letter of Credit, \$50 Landowner domestic filing fee	\$5,000 \$10,000 for financial statements	\$15,000 \$30,000 for financial statements	YES	NO	N/A
Oklahoma	1922/1990	Cash, surety, CD, financial statement, letter of credit, cashiers check	As established by licensed plugger	\$25,000 or \$50,000 net worth in Oklahoma for financial statement	YES Commission has authority to set surety amount	YES	\$25,000
Pennsylvania	1985/1997	Cash, surety, CD, Phased deposit bond	\$2,500	\$25,000	YES	NO	Security covers drilling, plugging, water supply, replacement and restoration
South Dakota	1943/1960	Cash, surety, CD	\$5,000	\$20,000	YES	YES	Required when the landowner or lessee is not a party to the leasing agreement
Tennessee	1972/1988	Cash, surety, CD, Letter of credit	\$2,000	\$10,000	YES	YES	\$1,500, reduced to \$1,000 after initial reclamation
Texas	1983/1991	Cash, surety, letter of	Annual fee ranges from	\$25,000 (1–10 wells)	NO	YES	For reclamation

**Table I. State Security or Financial Assurance Requirements (Continued)**

State	Security First Required/ Last Modification	Securities Permitted	Security for Single Wells	Blanket Bond	Can Regulatory Authority Alter Amount?	Separate Site Restoration Bond?	Amount / Conditions
		credit, well fee, first lien on equipment when value is equal to bonding	\$100 to \$750 plus \$100/inactive well	\$50,000 (11–99 wells) \$250,000 (>100 wells)			plants only. In the amount required to close the facility
Utah	1955/1983	Cash, surety, CD, letter of credit, negotiable U.S. bonds	\$1,000 (<1,000 ft) \$10,000 (>1000–<3000ft) \$20,000 (>3000–<10000ft) \$40,000 (>10,000 ft)	\$10,000 (<1,000 ft) \$80,000 (>1,000 ft)	YES	NO	N/A
Virginia	1955/1990	Cash, surety, CD	\$10,000 plus \$2,000 per acre of disturbed land	\$25,000 (1–15 wells) \$50,000 (16–30 wells) \$75,000 (31–50 wells) \$100,000 (51 or more wells)	NO	NO	N/A
West Virginia	1963/1992	Cash, surety, CD, irrevocable letter of credit, consolidated investment fund	\$5,000	\$50,000	NO	NO	N/A
Wyoming	1951/1995	Cash, surety, CD, letter of credit	\$5,000 (<2,000 ft) \$10,000 (>2,000 ft)	\$25,000 additional amount may be required for dormant wells or pits	YES	NO	Agency does, however, require additional bonding for certain pits
1 States that have flexibility on individual wells or within range set by legislature.							



## C. PLUGGING FUNDS AND WELL PLUGGING AUTHORIZATION

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 the wells for plugging and abandonment are identified, they are included on waiting lists established by the states and prioritized for plugging and abandonment. 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.
- ◆ States prioritize among wells to be plugged, focusing on those that pose the greatest potential harm.

Idle wells are not necessarily an environmental threat. Many wells are allowed to remain idle with approval of state regulatory agencies because they are not threatening the environment or public safety. However, an increase in the number of idle wells, which may or may not become orphan wells, can cause concern for state agencies.

### Changes in State Plugging Fund Balances

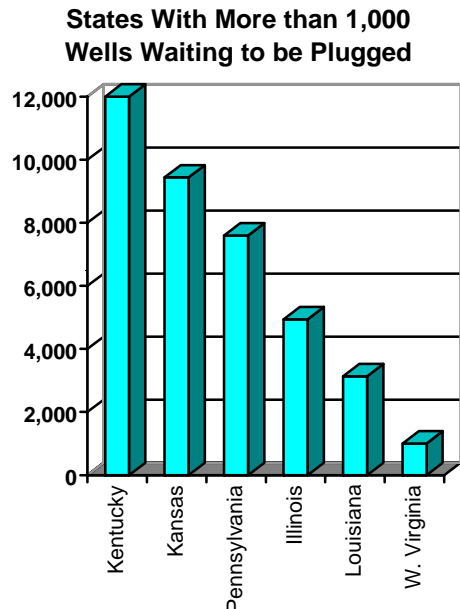
#### Increases Since 1996

California.....	\$500,000/yr
Colorado .....	\$168,000
Illinois.....	\$2,000,000
Indiana .....	\$150,000
Kentucky .....	\$100,000
Michigan .....	\$733,000
Mississippi .....	\$300,000
New Mexico .....	\$250,000
North Dakota.....	\$59,000
Pennsylvania .....	\$1,196,200
Tennessee .....	\$37,200
Texas.....	\$1,002,000
West Virginia.....	\$48,000

#### Decreases Since 1996

Florida.....	\$220,000
Louisiana .....	\$4,299,749
Missouri .....	\$21,100
New York .....	\$61,700
Oklahoma .....	\$100,000
Utah .....	\$29,000
Virginia.....	\$83,300

The plugging of orphan wells by state regulatory agencies remains a significant issue. Nebraska established a plugging fund in 1999 to address the orphan well problem. Thirteen states have increased their plugging fund balances since the 1996 survey (see inset), while six states have lower plugging fund balances. Nebraska has yet to set a target amount for their new plugging fund. Declines may be attributable to using funds for plugging and site restoration, changes in activities that contribute to the fund (fees, etc.), and administrative changes redirecting funds elsewhere.



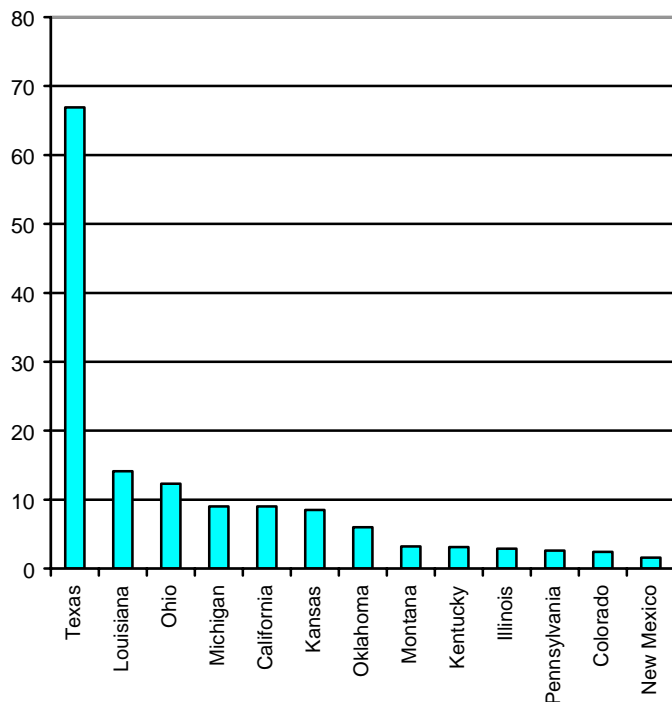
The number of wells waiting to be plugged in individual states at any given time may depend on a variety of factors, such as the number of oil and gas wells within the state regulatory program, the adequacy of security or financial assurance provided by oil and gas operators, the availability of state plugging funds and staff resources, and state

procurement procedures. Legal issues arising from insolvency can also delay plugging by either operators or the state.

The 2000 survey discovered that Kentucky remains the state with the most wells waiting to be plugged, an estimated 12,000. Prior to changes that strengthened financial responsibility, operators often walked away from wells that were no longer economically profitable, leaving the cost of plugging to the Commonwealth. Kansas has the second largest number of wells waiting to be plugged — an estimated 9,438. Four additional states have at least 1,000 wells currently waiting to be plugged with state funds: Pennsylvania – 7,600; Illinois – 4,940; Louisiana – 3,135; and West Virginia – 1,000. States with lower, but significant numbers of wells on the state plugging list include: Texas – 804; Indiana – 800; Oklahoma – 759; California – 480; Ohio – 443; Michigan – 425; Montana – 230; and New York – 200. The number of wells waiting to be plugged may not correspond to the number of orphan wells reported in Section III-H. This is because most states have a process to follow for adding wells to the state plugging list.

Although all orphan wells reported may ultimately require plugging with state funds, the figures

**Well Plugging Expenditures  
Under State Plugging Fund  
\$ Millions**



reported in this section are limited to those wells that have already been approved for plugging with state funds.

The following states have been very active in plugging wells under their respective programs since the 1996 survey: Texas – 7,055 wells plugged; Kansas – 1,892; Oklahoma – 941; Kentucky – 804; Illinois – 783; Louisiana – 641; and California – 349. The states which have plugged the greatest number of wells under their respective programs are: Texas – 15,476; Kansas – 3,142; Oklahoma – 1,455; Kentucky – 1,440; Ohio – 1,372; Illinois – 1,038; Louisiana – 712; and California – 680. Those states with significant fund expenditures under their programs to date are: Texas – \$66,898,000; Louisiana – \$14,090,000; Ohio – \$12,256,000; Michigan - \$9,033,000; California – \$9,015,000; Kansas – \$8,511,000; Oklahoma – \$5,970,000; Montana – \$3,180,000+; Kentucky – \$3,050,000; Illinois – \$2,900,000; Pennsylvania –

2,592,000; Colorado – \$2,352,000; and New Mexico – \$1,600,000+.

Up to the time of this survey, the states have spent \$69.2 million to plug and abandon 12,831 wells. The national average plugging cost is around \$5,400 per well, with state averages ranging from a high of \$125,000 per well to a low of \$1,075 per well. A cautionary note should be mentioned regarding the average plugging costs based upon the number of wells plugged and the amount of money spent. Some states are allowed to charge certain administrative or staffing costs to their plugging funds (which would increase the average cost per well), while

others charge only the actual costs of plugging and site restoration to the fund. In many instances, the states have established priority systems for expenditures of monies under their respective plugging funds. High on any state's list are wells that are either causing or have the greatest potential to endanger the environment and/or public health. Such wells frequently are more costly to plug and abandon than a well that is in good condition. Therefore, the average costs extrapolated from the figures available in this study may not reflect true plugging costs. Nonetheless, using the calculated national average plugging cost of \$9,800 per well, potential state plugging liability can be estimated. [For individual states, actual plugging costs may be higher or lower than the national average.] If all of the 57,064 orphan wells identified in this report (see Section III-H) require state plugging, and per well costs are equal to the national average, total state plugging liability could be around \$559 million.

Funding mechanisms vary greatly for the individual states. Some states supplement their plugging funds with bonds or other security forfeitures, or utilize plugging fund monies to supplement a security that is insufficient to plug a well. In some states, money is made available from general appropriations to the particular oil and gas agency, such as in Arkansas where funding comes from the Commission's budget. Like Arkansas, most of California's plugging funds come from its Division of Oil, Gas, and Geothermal Resources budget, which is supplemented by fees on unbonded idle wells as follows: idle more than 5 years, but less than 10 years – \$100 per well; idle more than 10 years, but less than 15 years – \$250 per well; and idle more than 15 years – \$500 per well. The Mississippi Oil and Gas Board uses excess funds from the Oil and Gas Conservation Fund (when the fund contains an amount over \$200,000 above the current fiscal year's estimated budget) to plug oil, gas, and Class II wells that are determined to be an imminent threat to the environment.

Michigan now has two funds that can be used for plugging wells: 1) Part 201 Environmental Remediation (1994 PA 451, as amended), is funded from general obligation bonds which are used to clean up contaminated sites, including oil and gas well sites; and 2) the Orphan Well Fund established in 1994, which is funded from a severance tax on oil and gas production. Bond forfeiture and salvage revenue are also used to replace expended funds. Pennsylvania also has two funds that can be used for plugging wells: 1) the Well Plugging Restricted Revenue Account, established in 1984 and renamed the Abandoned Well Plugging Fund in 1992, is funded by a \$50 surcharge that is added to the permit fee; and 2) the Orphan Well Fund, established in 1992, is funded by a permit application surcharge of \$100 for an oil well and \$200 for a gas well.

Permit fees are used to fund well plugging operations in Alabama, Florida, Illinois, New York, North Dakota, Texas, Virginia, and West Virginia. States that utilize a percentage of the gross production assessment or tax for well plugging include Colorado, Kansas, New Mexico, Ohio, Oklahoma, Utah, and Wyoming. Kentucky funds its plugging account solely with bond forfeitures and the interest accrued on the plugging fund accounts. Other states including Missouri, New York, Tennessee, and Texas utilize funds from penalty assessments for their plugging fund.

Five states: Alaska, Arizona, Maryland, Nevada, and South Dakota; have not established a plugging fund of any type. The fund established in Alabama in 1990 is dedicated to coalbed methane wells only.

Costs to administer plugging funds can be substantial and can require resources to be diverted from other important regulatory functions. While several states utilize plugging funds to pay the

administrative costs of the plugging program, including staff positions, other states lack this authority.

Many states have adopted policies or use specific criteria to set priorities for use of their plugging funds. In 1993, the IOGCC developed guidelines for state prioritization schedules (see Appendix A). Some states have a numeric ranking system that assigns a score to each orphan well, based upon specific criteria. Texas has such a system that involves a flow chart and score list (see Appendix B). Wells with higher scores are given a high priority for plugging by the state. State prioritization criteria, as well as requirements regarding the time a well may remain idle before being placed on the list for state plugging action, are listed below.

### **State Prioritization Criteria**

<b>Alabama</b>	Wells that are potentially dangerous to the public or environment (for coalbed methane wells only).
<b>Arkansas</b>	1) A written request from the property owner is required. 2) The well is an environmental hazard. 3) The well has no further producing capabilities. An operator is required to post a bond or letter of credit after a well has been shut-in for 12 consecutive months. Additional time may be granted by a majority vote of the Commissioners.
<b>California</b>	1) Hazardous wells; 2) bonded long-term idle wells; 3) unbonded long-term idle wells. Unless it represents a hazard, a well is permitted to remain idle for five years before being placed on the list for potential action by the state.
<b>Colorado</b>	The factors considered important by Colorado in prioritizing wells for plugging include: 1) no responsible party; 2) threat to public safety and/or welfare; and 3) cost and fund availability.
<b>Florida</b>	A well in Florida is allowed to remain idle for 5 years before it is placed on the list for potential state plugging action.
<b>Illinois</b>	1) Actively leaking wells or wells causing environmental damage; 2) wells that have caused environmental damage in the past and are located on leases with environmental problems associated with abandoned equipment, pits, etc.; and 3) wells on leases that have not sustained past environmental damage and do not cause any current problems or restrictions on current land use.
<b>Indiana</b>	Wells are prioritized based on environmental impact. Leaking wells are plugged under emergency contracting procedures. A well is placed on the list after the bond has been forfeited and the state has determined that a viable, responsible party does not exist.
<b>Kansas</b>	Abandoned wells located by staff in the field are designated as Priority I or Priority II. Priority II wells are defined as wells which pose no immediate or potential impact to the environment or public safety. Priority I wells are defined as those wells that either by well condition or location pose an immediate or potential impact to the environment or public safety. Within the Priority I category, wells are further subdivided into action levels of "A, B, and C" with

## State Prioritization Criteria

level “A” wells being the most serious. Abandoned well impacts are subdivided into Surface water, Ground water, and Public Safety. Wells that are either actively polluting or have a high degree of risk for pollution or danger to the public safety receive the highest priority in expenditure of state funds. Lower priority wells may receive some funding if associated with higher priority wells.

- Kentucky** Wells are prioritized by condition (both surface and subsurface physical integrity) and location (proximity to known aquifers, surface water supplies and public dwellings). Wells are then ranked with wells that are an environmental risk and/or potentially harmful to the public given top priority.
- Louisiana** All wells are prioritized 1 through 4. A number 1 ranking is the highest. A check list is used to establish priority. This check list includes: navigation hazard, leaking, rate of leak. The time a well is allowed to remain idle depends upon the well's priority ranking, with problem wells being plugged first.
- Michigan** All wells are ranked based on a numeric score. Wells are prioritized in two categories: Category I are leaking wells, Category II are nonleaking wells. Category I scores are based on the degree of environmental damage or threat to public health and safety. Category II scores are based on the potential for environmental damage or threat to public health and safety. In Michigan, a well is placed on the orphan well list if compliance actions taken by staff to have the well plugged demonstrate that the owner is either unknown or insolvent.
- Mississippi** Priority is given to orphan wells that present a danger to underground sources of drinking water. In Mississippi, a well is placed on the state's list for potential plugging action if it remains idle for 7 months to 13 months.
- Missouri** Priority is based on geology, hydrology, and the depth of a well in providing protection to ground water. In Missouri, a well must remain idle for a minimum of 2 years before it is placed on the list for potential plugging action.
- Montana** Threat to environment / land use; ranking based upon construction and location. In Montana, idle is not a factor; orphan and environmental risk is used to determine priority.
- Nebraska** 1) Danger to fresh water; 2) danger to a productive zone; 3) surface damage. An isolated well is provided one year, if in good condition, to remain idle before being placed on the list to plug. A well in a field having potential for enhanced recovery is maintained until final field plugging.
- Nevada** Any well which has production casing and has remained idle for over a one-year period; and any well with no production casing on which drilling operations have ceased for over 30 days; are considered temporarily abandoned.
- New Mexico** 1) Immediate threat to public health / environment. 2) Potential threat to public health / environment. 3) No potential threat to public health/environment. In New

## State Prioritization Criteria

Mexico, a well is allowed to remain idle for one year before it is placed on a list for potential state plugging action.

- New York*** 1) Threat to public safety; 2) leaking gas, oil or brine; 3) proximity to water supplies; and 4) integrity problems with the wellbore. A well becomes subject to plugging after being illegally shut-in for more than one year, or temporarily abandoned for more than 90 days. Once a well is identified as hazardous, it is placed on the plugging list and will remain there until it is plugged and abandoned.
- North Dakota*** The two main criteria are: 1) The length of time of abandonment; and 2) the potential hazard to the surrounding environment. After one year of inactivity, a well is subject to state plugging action.
- Ohio*** Field inspectors rate wells based on a standardized scoring system that prioritizes wells based on threat to public safety and the environment. All wells must be capable of production. If an inspector documents that a well is incapable of production, he/she will notify the owner. If the owner fails to respond, the Chief will issue an order requiring the owner to put the well into production or plug it, generally within 30 days.
- Oklahoma*** The wells are prioritized for plugging by the potential for endangerment to human health and safety, environmental damage and progressively less threat to the environment. API Bulletin E3, Environmental Guidance Document: Well Abandonment and Inactive Well Practices for U.S. Exploration and Production Operations, is used as a guide toward prioritization. Under OAC 165: 10-11-3, a well with production casing installed may remain idle for one year without any action by the Oklahoma Corporation Commission. Operators may then file for exception to the plugging requirements under OAC 165: 10-11-9 for a period of two years, if approved. Operators may file further request under the same rule for good cause shown. No well is placed on the state funded plugging list if a financially viable operator exists. A well may immediately be placed on the list if the operator is insolvent, unknown or incapable of plugging a well causing environmental damage.
- Pennsylvania*** Division Chief prioritizes wells for both funds based on various factors as follows: Abandoned Well Plugging Fund — possible effect on public or private water supplies, public safety, surface water or other types of water supplies affected, ground water, and well integrity; Orphan Well Plugging Fund — based on location (public vs. private land), proximity to water supply building (public or private), distance from stream, body of water, or wetland, and special protection watershed type. [See Appendix B].
- Tennessee*** In Tennessee, the wells which affect the environment the greatest, are at the top of the priority list. There is no time limit for a well to remain idle before being placed on a list for potential state plugging action.

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<b>Texas</b>	Statewide Rule 14 allows one year of inactivity before a well is considered in violation and enforcement action is initiated. If an operator is in default of more than two Commission orders requiring compliance and a well is a priority 3 or greater, an idle well may be recommended for plugging with Oil Field Cleanup funds as soon as it is identified through a routine lease inspection or a complaint of an abandoned well and determined to be in violation. A well recommended for enforcement action may take several years (2–4) before an abandoned well case is referred for plugging with Oil Field Cleanup funds if enforcement action fails to bring the well into compliance. (See Appendix B for State-funded Plugging vs. Show Cause Plug Hearing Decision Tree).
<b>Utah</b>	1) Potential of injury to public health and safety and the environment; 2) No responsible operator for plugging; 3) No responsible surety for plugging; 4) Forfeited bond amount is insufficient for plugging; 5) Proximity to other wells to be plugged; and 6) Cost, available funds, lease type and other factors. In Utah, a well is generally allowed an extended shut-in period of 5 years with good cause shown after an initial period of 12 consecutive months in a shut-in status before it is placed on a list for potential state plugging action. Additional requests for shut-in extensions beyond 5 years are reviewed on a case-by-case basis.
<b>Virginia</b>	Wells are prioritized according to potential danger to public health and safety and the environment. In Virginia, no time is specified as to how long a well is allowed to remain idle before it is placed on a list for potential state plugging action. Orphan wells are on a list and bond forfeiture wells are placed on the list at the time of forfeiture.
<b>West Virginia</b>	The degree to which a well is a threat to health, safety, or the environment, and the degree to which a well is an impediment to mineral development.
<b>Wyoming</b>	In Wyoming, the Supervisor maintains a well plugging schedule which prioritizes wells for plugging through an assessment of the well's potential to adversely impact public health, public safety, surface or ground waters, surface use or other mineral resources. Wyoming rules do not provide for a specific amount of time before which an idle well is placed on a list for potential state plugging action. However, a show cause hearing is set by the agency once it is discovered that the operator is no longer actively maintaining the property nor filing reports specified by the agency's rules and regulations.

Table II shows funding amounts, sources, number of wells plugged, and monies spent or obligated.

**Table II. State Plugging Funds**

State	Fund Established	Target Amount	Current Amount	Funding	No. of Wells Plugged	Amount Spent	No. of Wells on Waiting List
Alabama	1990	\$1,000,000	\$526,000	\$150 plugging fee for all coalbed methane wells permitted	0	\$0	0
Alaska		N/A					
Arizona		N/A					
Arkansas	1991	\$150,000	\$650,000	From Commission budget including tax assessments, permit fees, etc.	31	\$188,000	N/A
California	1977	\$500,000 per year	\$1,000,000	Oil & gas production assessment and idle well fees	680	\$9,015,000	480
Colorado	1990	\$500,000	\$1,129,071	Mil levy on production and severance tax	144	\$ 2,352,180	42
Florida	1989	Unlimited	\$0	Permit fees and per well fees from trust fund	0	\$0	0
Illinois	1991	\$500,000– \$750,000 per year	\$500,000–\$750,000 per year	Operator fees, based on no. of wells \$150/year – 1 well \$300/year – 2 to 5 wells \$750/year – 6 to 25 wells \$1,500/year – 26 to 100 wells \$1,500/year + \$12.50/well – over 100 wells	1,038	\$2,900,000	4,940
Indiana	1988	None	\$975,000	Oil and Gas Environmental Fund, which is funded by revenue from penalty assessments and permit fees; and Bond Forfeiture Fund, which if funded by bond forfeitures	82	\$540,000	800
Kansas	1982	Unlimited	\$500,000 per year	Allocated from conservation fee fund which is mix of oil & gas assessments and permit fees	3,142	\$8,511,000	9,438
Kentucky	1966	None	\$3,000,000	Forfeited bonds, with forfeited bond and cash bond account interest transferred to plugging fund	1,440	\$3,050,000	12,000+
Louisiana	1993	\$10,000,000	\$1,700,000	\$0.01 per barrel of oil and \$0.005 per Mcf of	712	\$14,089,680	3,135



**Table II. State Plugging Funds (Continued)**

State	Fund Established	Target Amount	Current Amount	Funding	No. of Wells Plugged	Amount Spent	No. of Wells on Waiting List
				gas produced			
Maryland	N/A						
Michigan	1968/1994 <sup>1</sup>	None/\$3,000,000	\$1,300,000	Two percent of revenue received from severance tax	300	\$9,033,000 <sup>1</sup>	425
Mississippi	1991	None	\$1,500,000	Oil and Gas Board funds in excess of budget requirements and an annual fee of \$100 per unplugged production well	55	\$500,000	20
Missouri	1983	\$100,000 ceiling	\$19,000	Penalty assessments on operators and bond forfeitures	69	\$65,500	N/A
Montana	1989	\$200,000	\$200,000	Resource Indemnity Trust Tax	137	\$3,180,000+	230
Nebraska	1999	To be determined in rule making. Rule to be promulgated	\$0	Fee charged for each inactive well	0	\$0	2
Nevada	N/A						
New Mexico	1977	\$1,000,000 maximum	\$550,000	Additional oil and gas conservation tax of 0.01% (from .18 to .19). Also bond foreclosures and judgments obtained.	200	\$1,600,000+	40
New York	1981	\$1,500,000	\$160,000	A \$100 drilling permit fee	6	\$250,000	200
North Dakota	1983	\$50,000	\$108,000 Cash Bond Fund has a balance of \$288,000 <sup>2</sup>	Fees collected by the Oil and Gas Division, forfeiture of bonds, federal agencies, donations, state's Oil and Gas Impact Fund, Section 38-08-04.8, sale of confiscated equipment, and other monies in account	11	\$266,000	2
Ohio	1967	\$1,000,000	\$800,000	The fund receives 20% of the mineral	1,372	\$12,256,000	443

**Table II. State Plugging Funds (Continued)**

State	Fund Established	Target Amount	Current Amount	Funding	No. of Wells Plugged	Amount Spent	No. of Wells on Waiting List
		annually		severance tax on oil and gas production; and bond forfeiture			
Oklahoma	1990	\$5,000,000 through June 30, 2001	\$100,000	Petroleum excise tax of 0.095 of 1% of value of total sale of oil and gas. 10.526% of total tax revenue generated under Title 68 O.S., Article 11, which is about \$30,000 per month.	1,455	\$5,970,000	759
Pennsylvania	1984/1992	None	\$1,724,000	Surcharge on permit fees	135	\$2,592,000	7,600
South Dakota	N/A						
Tennessee	1972	None	\$58,000	Fines and forfeitures	0	\$0	2
Texas	1983	\$3,000,000 per year	\$5,792,000	Fees, enforcement penalties, proceeds from letters of credit and bond forfeitures, private contributions and, salvage proceeds	15,476	\$66,898,000	804
Utah	1992	\$60,000 per year	\$135,000	From Oil and Gas Conservation Fee	46	\$283,000	38
Virginia	1990	\$100,000 Plugging and Restoration Fund	\$130,000 (Plugging & Restoration Fund) \$25,000 (Orphaned Well Fund)	Gas and Oil operator's fees	11	\$250,000	0
West Virginia	1977	None	\$74,000	\$100 fee for each well drilled plus bond forfeitures, plus civil penalties collected	22 <sup>3</sup>	\$565,800 <sup>2</sup>	1,000
Wyoming <sup>4</sup>	1951	None	N/A	From oil and gas conservation tax revenue	70	\$320,000	3
TOTALS			\$22,905,071		26,634	\$144,675,160	42,403

- 1 In Michigan, significant amounts from other funds (\$5.7 million) have also been used for plugging wells and for site reclamation. For this study, that figure is also used to calculate plugging fund expenditures. It should also be noted that approximately 50 wells, drilled prior to 1968, were plugged using a special appropriation.
- 2 In North Dakota, there are two funds: the Abandoned Oil and Gas Well and Site Reclamation Fund, and the Emergency Plugging Fund.
- 3 In West Virginia, the figures for the number of wells plugged utilizing the state's plugging fund is since 1993. The amount spent is also only since 1993.
- 4 In Wyoming, there is not a designated plugging fund, but mill levy funds are used by the Wyoming Oil and Gas Conservation Commission, under §30-5-104(d)(I), to plug orphan wells and to make up bonding shortfalls when plugging wells.

## D. APPROVAL PROCEDURES AND TECHNICAL REQUIREMENTS

When the Petroleum Technology Transfer Council (PTTC)<sup>1</sup> surveyed independent oil and gas producers about their technology needs and regulatory impediments, “produce or plug” requirements were highlighted as an area of concern.<sup>2</sup> Producers said that such requirements sometimes force premature abandonment, to no one’s benefit. State regulators are also concerned about premature abandonment and have worked to find ways to avoid this potential waste of oil and gas resources. Procedures have been developed by states to allow wells to remain viable for production or other use in the future, if the well does not pose a threat to human health or the environment. This is done to allow operators to further evaluate the economic potential of existing producing horizons, new potential productive zones, enhanced recovery operations, waste disposal operations, and other cost-saving technologies. Future increases in price may make these wells economic to produce again. It is well known that once a well is plugged and abandoned, the cost is prohibitive to reenter it and recover marginal reserves.

States use several terms to describe wells that are allowed to remain unplugged but not producing, as described in Section III-A. For purposes of this section, the term *temporary abandonment* will denote wells approved by a state agency, under the terms of that agency’s requirements, to remain unplugged and non-producing for a period of time.

Most states allow wells to remain idle for a short period (six months to one year) without approval by the state agencies. Beyond that period, most states require approval for production and injection wells to remain idle. California is the only major producing state that does not require approval for wells to be temporarily abandoned. Florida and Virginia also do not require state approval to temporary abandonment. Maryland does not give temporary abandonment approval for injection wells because it prohibits wells that inject oil and gas nonhazardous wastes.

Reasons for Temporary Abandonment	
∅	Future use as: — Producing well — Enhanced recovery (injection) well — Disposal well
∅	Economic conditions
∅	Waiting for pipeline connection

Conditions under which temporary abandonment is allowed do not vary widely among states. Future utility of a well, either for production purposes, enhanced recovery, or injection, is the most common reason for temporary abandonment, followed by economic conditions. Most states are not in the position to determine the economic viability of wells, leases, or operations, and leave those tasks to the owner/operator. However, states requiring a statement of future use may require extensive

geological and engineering information, including a detailed plan and time schedule for returning the well to use. If owner/operators fail to properly justify requests or fail to comply with the plans, temporary abandonment permits may be denied or revoked. Some states (Alabama,

<sup>1</sup> The Petroleum Technology Transfer Council is a nonprofit organization established to facilitate the transfer of oil and gas production technologies to independent producers across the U.S. The PTTC maintains 10 regional technology transfer centers.

<sup>2</sup> Petroleum Technology Transfer Council, *Technology and Related Needs of U.S. Oil and Natural Gas Producers*, March 1996.

Kentucky, Maryland, and New York) specifically mentioned connections to pipelines as a condition for temporary abandonment. Most other states also allow wells to be idle for this reason, but probably define these wells as shut in rather than as temporarily abandoned. Lack of a pipeline connection is a common reason for temporarily idling gas wells, especially in newer producing areas.

Of the states requiring prior approval, most allow an initial period for temporary abandonment of six months to one year. Those states allowing a longer initial period include: Florida, Illinois, Indiana, New Mexico, Pennsylvania, and West Virginia – five years; Kentucky, and Oklahoma – two years. Most states allow the program director wide latitude in determining if a permit for temporary abandonment should be approved, extended or denied. Maryland does not specify a definite time period in granting initial approval for temporary abandonment of a well. While Alaska has no definition for temporary abandonment, it does allow indefinite suspension based on the lack of production and market facilities or the need for pool delineation or evaluation. The requirements for suspension are similar to those for permanent abandonment. They include an additional requirement for a bridge plug 200 feet to 300 feet below surface, capped by 100 feet of cement. The Environmental Protection Agency gives guidance for the temporary abandonment of injection wells. Changes since the 1996 study show that some states are allowing a longer initial period.

<b>Initial Period Approved for Temporary Abandonment</b>	
	Number of States Allowing
Indefinite	2
5 years	6
2 years	2
1 year	12
6 months	6
Approval not required	2
Not applicable	2

Nearly all states allow extensions beyond the initial period of temporary abandonment. In Illinois, extensions on active leases are renewed annually; on inactive leases extensions are allowed only if future utility for the well can be demonstrated. All other states except Michigan, Missouri, and Texas allow an unlimited number of extension. In Arizona, Arkansas, Colorado, Kansas, Mississippi, Nebraska, New York, North Dakota, Pennsylvania, Texas, and Wyoming the extension must be renewed annually. Alabama, Missouri, Nevada, Ohio, and South Dakota allow six-month extensions. In Kentucky, when the initial temporary abandonment permit expires, the operator must reapply to have the permit renewed. Michigan allows extensions only if granted by the Supervisor of Wells. New York allows one-year extensions with cause. Texas limits its one-year extensions of temporarily abandoned status to four times for unbonded wells, although bonded wells may be extended an unlimited number of times. Twenty-three of the 32 states surveyed require that injection wells receive temporary abandonment approval in the same manner as production wells.

Approving and granting extensions for temporarily abandoned wells does not mean that a state takes no further interest in the condition of the well. Sixteen states have specific requirements for testing temporarily abandoned wells. In two of the states, which do not require testing, Alaska and Arizona, a test may be ordered by the regulating agency. In Oklahoma, South Dakota, and Tennessee, testing is required only on injection wells. Most states require a mechanical integrity test (MIT) of the well every two to five years. Wells that cannot demonstrate integrity are ordered repaired or plugged. In California, a fluid-level test is required for all five-year (long-term) idle wells, with a two-year testing interval for wells in freshwater areas and a five-year testing interval for wells in areas with no fresh water. A MIT is required when a fluid level is substantially different between testing intervals or is above the base of fresh water. Texas requires a fluid-level survey every year for wells more than 25 years old, but Kansas and

Nebraska require this test annually, with a MIT depending on well conditions. Colorado requires a MIT within two years of a well being shut in and within 30 days of temporary abandonment. North Dakota requires a MIT only if problems are suspected, whereas Pennsylvania requires a MIT annually.

When wells become orphaned and the states assume responsibility to plug, most do not explicitly evaluate the economic potential of the well for future use; however, Alaska does. If Alaska's Commission determines that an orphaned well has a tangible value as a producer, does not pose a threat to correlative rights, a freshwater or a hydrocarbon bearing zone, and is of sound mechanical integrity, the well may not be ordered plugged. In other states, the use of state funds to plug orphan wells is done on a prioritized basis (see Section III-C and Appendix B). Wells that pose no threat and are in sound mechanical condition are either not plugged or have a very low priority status. These states generally maintain an "Orphaned Well List" that is accessible to the public and operators. If someone wanted to use an orphaned well, complied with the state's individual operator requirements, and obtained legal title, the state can transfer the well to the new entity. In most states this rarely occurs, but Texas has an innovative program to encourage the re-use of wells about to be plugged with state funds (see Section IV).

Industry also has developed appropriate procedures for well abandonment (both permanent and temporary). The American Petroleum Institute (API) has developed risk-based guidelines for operators who must ensure environmental protection for shut-in, temporarily abandoned, or permanently abandoned wells.<sup>3</sup> While these guidelines are subordinate to existing state requirements, they provide guidance to operators in states lacking requirements, as well as identifying good operating practices. The shutting-in or the temporary abandonment of wells may be performed when a wellbore has future utility — such as in enhanced recovery projects — and must be held in a condition whereby routine operations can restore it to service. Permanent abandonment is done when no future utility for a wellbore exists and the wellbore is indefinitely sealed to prevent fluid migration. API's risk-based guidelines are discussed further in Section III-I. These guidelines were used in the 1996 study and are still the controlling authority, according to the API.

A brief synopsis of state approval procedures and technical requirements is found in Table III.

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<sup>3</sup> American Petroleum Institute, *Environmental Guidance Document: Well Abandonment and Inactive Well Practices for U.S. Exploration and Production Operations*, API Bulletin E3, January 31, 1993.

**Table III. Approval Procedures and Technical Requirements**

State	Conditions For Temporary Abandonment	Specific Approval Required	Initial Period	Extension	Test Req'd on Idle Production Wells	Frequency	Approval for Idle Injection Wells
Alabama	Future utility, connection to pipeline	YES	6 months	6 months, unlimited number	NO	N/A	YES
Alaska	Operator economic conditions, future utility	YES	Indefinite	No specific time period	May be ordered		No, if temporarily shut-in; Yes, if suspended
Arizona	Future utility, observation and testing	YES	1 year	1 year intervals	Commission may require	Commission may require annual testing	YES
Arkansas	Operator economic conditions, future utility	YES	1 year	1 year, unlimited number	NO	N/A	NO
California	Wells operating close to economic limit, future utility	NO	N/A	N/A	YES	Fluid level for all five year idle wells	NO
Colorado	Operator economic conditions, future utility	YES	1 year	1 year, unlimited number	YES	Within 2 years of shut-in and within 30 days of temporary abandonment	YES
Florida	Operator economic conditions, future utility, and availability of equipment	YES	5 years	5 year, if MIT passed	YES	5 years	YES
Illinois	Future utility and testing	YES	5 years	Annually on active lease; based on evidence at hearing for inactive leases	YES	MIT every 5 years or fluid level every year	YES
Indiana	Demonstration of future potential and mechanical integrity	YES	5 years	5 years, with justification	YES Annual fluid level test	Pressure test, annual fluid level test, and MIT every 5 years	YES
Kansas	Economic conditions, future utility	YES	1 year	1 year, unlimited number, proof of need more stringent after 5 years and 10 years	YES – fluid level, MIT can be required	Fluid level test annually, MIT generally every 5 years	YES
Kentucky	Economic conditions and connection to	YES	Up to 2 years	2 years Operator must show	N/A	NO	N/A

**Table III. Approval Procedures and Technical Requirements (Continued)**

State	Conditions For Temporary Abandonment	Specific Approval Required	Initial Period	Extension	Test Req'd on Idle Production Wells	Frequency	Approval for Idle Injection Wells
	pipeline			casing string adequately cemented			
Louisiana	Future utility	YES	No time limit	N/A	NO	N/A	NO
Maryland	Economic conditions, future utility, connection to pipeline	YES	Indefinite	N/A	NO	N/A	N/A
Michigan	Operator hardship, future utility	YES	1 year	5 years, by Supervisor of Wells	NO	N/A	YES
Mississippi	Economic conditions, future utility	YES	6 months	Administratively for 12 months, then after notice and hearing for another 12 months	NO	N/A	YES
Missouri	Economic conditions, future utility	YES	6 months	6 months, up to 2 years	NO	N/A	YES
Montana	Economic conditions, future utility	YES	1 year or more	No limit if justified	YES	Variable; 2 years for idle injection wells	YES
Nebraska	Economic conditions, future utility	YES	1 year	1 year	YES	Fluid level or MIT yearly	YES
Nevada	Economic conditions, future utility	YES	6 months	6 months (case -by -case basis)	YES	MIT generally every 5 years	YES

**Table III. Approval Procedures and Technical Requirements (Continued)**

State	Conditions For Temporary Abandonment	Specific Approval Required	Initial Period	Extension	Test Req'd on Idle Production Wells	Frequency	Approval for Idle Injection Wells
New Mexico	No justification needed other than evidence the casing is sound	YES	5 years	4 years unlimited number	YES	MIT must be repeated once within previous 12 months	NO If idle for 6 months, the well reverts to regular well status, and requires approval for temporary abandonment
New York	Future utility, pipeline construction	YES	1 year (shut-in) 90 days (TA)	1 year, with cause (shut-in) reasonable time period with cause (TA)	NO		YES
North Dakota	Future utility, or any other purpose related to oil and gas production	YES	1 year	1 year, unlimited number	YES	If problems suspected min. of every 5 years	YES
Ohio	Economic conditions, future utility, or adverse weather conditions	YES	6 months	6 months, unlimited number	NO	N/A	YES
Oklahoma	Economic conditions, future utility, plans for enhanced or secondary recovery operations	YES	2 years	2 years, unlimited number	NO, Only injection	Every 2 years	YES
Pennsylvania	Economic conditions, future utility	YES	5 years	Year to year, unlimited number	YES	MIT annually	YES
South Dakota	Economic conditions, future utility	YES	6 months	6 months, unlimited number	YES Only for UIC wells	Every 5 years after initial testing	YES
Tennessee	Economic conditions	YES	No limit	Allowed with no set time limit	NO, Only injection	Every 5 years for injection wells	NO



**Table III. Approval Procedures and Technical Requirements (Continued)**

State	Conditions For Temporary Abandonment	Specific Approval Required	Initial Period	Extension	Test Req'd on Idle Production Wells	Frequency	Approval for Idle Injection Wells
Texas	Future utility	YES	1 year	1 year, 4 times, unlimited number for bonded wells	YES	Every 5 years for disposal and injection wells, & every 5 years for wells inactive more than 25 years	YES
Utah	Economic conditions future utility	YES	1 year	Up to 5 years, unlimited number	NO Only proof of mechanical integrity	Upon request of an extension to previously approved temporarily abandoned well	YES
Virginia	Economic conditions, future utility	NO	N/A Notice provided on monthly and annual reports	N/A	NO	N/A	NO
West Virginia	Bona fide future use	YES	5 years maximum	May be renewed unlimited number	YES	As requested	YES
Wyoming	Economic conditions, future utility	YES	1 year, or at Supervisor's discretion	1 year, or term set by the Supervisor. No statutory limits on number of renewals	YES	Every 5 years	YES

## E. DATA MANAGEMENT, WELL TRACKING AND INVENTORY METHODS

To identify and monitor idle wells, the vast majority of states indicated that they routinely review production and injection reports for wells with zero production and check current reports against previous reports to identify wells that have been removed. However, this was not the case in Illinois, Indiana, Maryland, Ohio, Oklahoma, and Virginia. In Illinois, no authority is given to collect production data, which precludes this method as a way to identify idle wells. Ohio does check reports for wells with zero production, but does not compare the findings against previous reports to identify dropped wells. Virginia does not require permits for idle wells. Therefore, the state cannot track idle wells in this manner. The ability to check idle wells through production reports is limited in those states that have production reporting on a strictly lease basis rather than an individual well basis (i.e., Colorado, Kansas, Missouri, Nebraska, and Tennessee). In Louisiana, oil and casing head gas are reported on a lease basis. However, gas and condensate are on an individual well basis. Michigan requires some prorated wells to report on an individual well basis, while nonprorated wells report on a lease basis. Oklahoma and Texas require individual well reporting for gas wells, but oil wells report on a lease basis.

States also use other methods for identifying and monitoring idle wells. In California, production and injection reports for all wells are filed on a monthly basis.

### Tools Used by States to Track Wells

- ∅ Analysis of production and injection reports
- ∅ Audits
- ∅ Field inspections
- ∅ Improved data management techniques

An idle well list is generated through comparative analysis of the monthly reports. Through its audit process, the state is able to check the accuracy of production and injection reports submitted by the operator. An additional check in the state of Louisiana occurs when an operator fails to submit its annual regulatory fee and other required reports. Alabama maintains an active file on all wells that have been drilled. For those that are not in production and have been inactive for six months, a letter is sent to the operator asking about the status and future utility of the well. In addition, many states utilize field inspections to identify idle wells.

Data management capabilities of the states vary, and these capabilities have an impact on the ability to identify and monitor idle wells. The data available to identify and evaluate idle wells vary widely among the states. Useful information for identifying idle wells and determining their production capabilities or the risks associated with the well remaining idle include location, reservoir, age, construction, location of underground sources of drinking water, and other surface and subsurface conditions. Often, these data are not available for older wells, or are not included in the state's automated data management system. The IOGCC published a guidance document on minimum and "expanded" categories of data that states should have available to manage all oil and gas wells, including idle wells.<sup>4</sup>

Additional information on data management capabilities of state regulatory programs (not specific to idle wells) is available from the Underground Injection Practices Research

<sup>4</sup> IOGCC, *Guidelines for States: Exploration and Production Data Management*, 1996.

Foundation (UIPRF) for the Department of Energy.<sup>5</sup> Also, many states have implemented, or are in the process of implementing, a Risk Based Data Management System (RBDMS) developed under the sponsorship of the Ground Water Protection Council<sup>6</sup> and the U.S. Department of Energy. This PC-based program is designed to allow states to use risk analysis in a database program to track data related to oil, gas, and injection wells. The system includes several modules that cover permitting, enforcement, well construction and testing, and many other components.

A brief description of data collection and management methods currently used by the states follows.

### **Data Collection and Management Methods**

<b>Alabama</b>	Geologic data includes well logs, core data, and core analyses. Engineering data includes monthly production reports, well tests, bottom hole pressure tests, pressure-volume-temperature (PVT) analyses, injection reports, completion and stimulation records. The Oil and Gas Board also has initiated a well-file management, production management, and injection management system for all wells.
<b>Alaska</b>	Key information for individual wells is archived in mainframe data files. Various sets of information are maintained and manipulated in workstation and PC applications. Databases used include Oracle and Access. The state is increasing the volume of information kept in electronic databases and is implementing a GIS system to further facilitate access to information.
<b>Arizona</b>	The state maintains paper hardcopy production records, well files, and a sample and core repository. Monthly production data is entered into a computer database. Monthly production report is generated in database.
<b>Arkansas</b>	Monthly producers reports are received by the Oil and Gas Commission. This information is not automated, but the Commission is working towards that goal.
<b>California</b>	The principal database is the monthly well production and injection reporting system, called WellStat. All wells, other than abandoned wells, are included and monthly production and injection data are recorded. Printouts and various computer media are available. Well histories and technical well data are available on hard copy, microfiche, and microfilm.
<b>Colorado</b>	The COGCC is utilizing a single Microsoft SQL server 7.0 database engine with three databases: 1) MRBD — the master records database — for organization,

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<sup>5</sup> CH2M Hill and Digital Design Group, Inc., *Phase I Inventory and Needs Assessment of 25 State Class II Underground Injection Control Programs*, prepared for the Underground Injection Practices Research Foundation, July 1992.

<sup>6</sup> The Ground Water Protection Council is a national nonprofit organization of state and federal ground water and underground injection control regulatory agencies, regulated industry representatives, environmentalists, and concerned citizens.

## **Data Collection and Management Methods**

structured querying and reporting; 2) Workflow — the Workflow database — for auditing and editing of newly submitted data; 3) Workflow Archive — the Workflow Archive database — for permanent storage of operator submitted records.

The system is automated. Regulatory reports are submitted to the COGCC and date entered by data entry personnel. The reports are assigned to the next person in the Workflow according to detailed Workflow routing procedures. The Workflow routing assignments are designated to audit and edit the information to insure compliance and authorize any requested operations. Once the processing is complete, the data is written to the MRDB and deleted from the Workflow database. The delete in the Workflow database causes the record to be written to the Workflow Archive database. As soon as the records are written to the MRDB, they are queryable on the intra/internet query applications.

### ***Florida***

The state has three databases on a PC-based computer system. Production statistics are stored on spreadsheets and basic well data are stored in database programs.

### ***Illinois***

The state maintains a networked, multi-user computer database on well location and current ownership, well construction, mechanical integrity test, temporarily abandonment test information, and compliance status. Another database is maintained on the overall compliance status and ongoing enforcement actions for each operator. The agency does not have the authority to collect production data.

### ***Indiana***

The Division of Oil and Gas maintains an Access database. The Indiana Geological Survey also maintains a database. Both organizations maintain paper files. The information is automated. Automated information is currently available for Division personnel. The Division of Oil and Gas and the Indiana Geological Survey are currently working to combine databases and make automated data available to the public.

### ***Kansas***

The state implemented the Risk Based Data Management System (RBDMS) in February, 1998. All Underground Injection Control (UIC) well information has been downloaded from mainframe database. Plugged well database, existing KCC well database and vendor databases have been compiled into the RBDMS. The state has the largest implementation of RBDMS with more than 350,000 well records. Efforts at reconciling multiple well records and well location data is ongoing. Kansas looks for unreported or unpermitted idle wells by reviewing production reports. District field offices routinely inspect leases and communicate with individual operators. Complaints, filed with the KCC, also result in the discovery of improperly permitted idle and/or abandoned wells.

## **Data Collection and Management Methods**

- Kentucky** The Geological Survey and the Department of Mines and Minerals have databases that track well location information and completion and plugging records. The data are available to the public in printout form or on overlay maps. The Geological Survey plans to automate well data and location information for public use. Production information is collected by the Department of Revenue; however, it is kept confidential. The Department of Mines and Minerals has initiated its own production reporting program beginning with 1994 production.
- Louisiana** The Office of Conservation uses the Oracle database system. Data is available on the internet. The URL address of the internet accessible Oracle database is: <http://www.dnr.state.la.us/index.ssi>. The state looks for unreported or unpermitted idle wells by reviewing production reports, checking current reports against previous reports, and by site inspections. However, to give operators every opportunity to put the well back into production, Louisiana allows a considerable amount of time to pass before action is taken.
- Maryland** A PC database is utilized for maintaining oil and gas permit information, including well location and construction, subsurface geology, well completion, performance bond, liability insurance coverage, and enforcement actions. Monthly production information is confidential, and is kept separately in spreadsheets.
- Michigan** A PC database and Michigan Implementation of Risk Based Data Management System (MIR) are used for maintaining oil and gas geologic and engineering data, including permit, subsurface geology, well completion, performance bond and enforcement actions. Michigan plans are to develop electronic filing of records and data availability.
- Mississippi** The State Oil and Gas Board has implemented the Risk Based Data Management System (RBDMS).
- Missouri** Production data, operator data, and well information (well construction, etc.) are automated in PC databases. Access database is used.
- Montana** Information includes well data from files and production reports, which are filed in a computer-based system.
- Nebraska** The state utilizes: the Risk Based Data Management System (RBDMS) program, Access database, manual databases, production data, and well data. Nebraska utilizes the RBDMS with production module on personal computers in a local area network.
- Nevada** The Nevada Bureau of Mines and Geology uses PC file software for the well database. The Bureau of Land Management (BLM) state offices use Dbase software, and the Division of Minerals uses Paradox software. Nevada is automated. Custom sorts may be used to generate specific reports. The Bureau of Mines and Geology has the capability to generate custom plotted maps. The Division has an upgraded version of the BLM monthly report of operation (MRO)

## **Data Collection and Management Methods**

production system which is a completed Dbase platform.

- New Mexico*** The state utilizes: Oil and Natural Gas Accounting and Revenue Database (ONGARD), and Risk Based Data Management System (RBDMS). Information is entered on-line and the data is available to all users.
- New York*** The state uses a multi-user system with a fully relational database. The state has more than 32,700 wells in the database, out of an estimated 65,500 wells drilled in the state. The annual production information has been computerized since 1983, and historic information is added as records become available and staffing constraints allow.
- North Dakota*** Various files, including Lease-Master File; production records; wells by section, township and range; monthly transporter records, monthly purchaser records; UIC file data; injection data; wells in a CTB; monthly gas plant reports; yearly gas plant totals; status of a bond; stripper-well determinations; meter records; and site restoration data, are automated. In addition to the hardcopy files, the listed databases exist on an IBM 3090 mainframe. Customized data sets are downloaded to an IBM RS 6000 as needed. Routine data access is through workstations to the RS 6000.
- Ohio*** In 1996, the Division implemented its new Risk Based Data Management System. The database resides on a PC-based client-server network. The database includes modules for permitting, bonding, ownership, completions, productions, plugging, and compliance tracking.
- Oklahoma*** The state has four entities collecting well data: the Corporation Commission; the Tax Commission; the Commissioners of the Land Office (state lands only); and the Geologic Survey. The information maintained includes permitting, well construction, production (actual measured production as it is taken from the lease), sales (volumes and values as taken and bought by the purchaser), injection and disposal volumes and pressures, purchaser, operator, and plugging data. The systems run on a variety of platforms: IBM mainframe, client/server networks and stand alone PC systems. The various agencies allow some information to be sent in a digital format. The Tax Commission, Corporation Commission and the Commissioners of the Land Office allow monthly reported production/value information to be sent via computer tape, cassette, and diskette. Oklahoma is working toward Internet filings for permitting, well construction, production and other information but has not yet implemented such methods. Databases are kept on permitting, production, well construction, sales, purchaser, operator, and well plugging. The system runs on a variety of platforms, including mainframe, client/server, and stand-alone PC.
- Pennsylvania*** Hard copy files are maintained in the regional offices in Pittsburgh and Meadville. Information related to drilling, inspection, compliance, and bonding is entered into a mainframe computer that is accessed by staff and the public. Production information is entered into a DEC VAX computer. The mainframe is a DEC Oracle database computer. Bureau of Oil and Gas Management information is

## **Data Collection and Management Methods**

available through a Web site.

- South Dakota** The state maintains geological and engineering files that include well logs; sample descriptions; core analyses; water, oil, and gas analyses; drill-stem test results; sample cuttings and cores; monthly production and injection reports; bottom-hole pressure tests; annual gas/oil ratio tests; mechanical integrity tests; underground injection control data; wells certified to the Federal Energy Regulatory Commission (FERC) for wellhead pricing; well completion and plugging reports; and sundry notices. Hard copies are maintained for consultation and copying. The South Dakota Department of Environment and Natural Resources uses Microsoft FoxPro.
- Tennessee** The state uses FoxPro, D-Base, and paper files. Oil and gas information is not yet available through an automated system. In regards to looking for unreported or unpermitted idle wells, the state will review production reports for wells with zero production when confronted with an existing situation.
- Texas** Primary database systems are IMS mainframe, Oracle RBDMS on UNIX, ArcInfo GIS, land ACTI. Some data are carried on Rbase systems, but the Commission is in the process of converting the data to Oracle. This will be accomplished through a mainframe computer system and PC network database applications such as Oracle and Rbase.
- Utah** An internally developed database for well and production data has been established on local network client-server platform. The Division also uses the Risk Based Data Management System (RBDMS) distributed through the Ground Water Protection Council for Underground Injection Control (UIC) program data. Well logs and individual well files in both hard copy and on microfiche are also available for review in the Division's Public Information Center. The Division utilizes an automated production and disposition reporting system, which incorporates monthly turn-around documents prepared by operators. Well data, production data, and other information is available via the Division's Internet Web site.
- Virginia** The Division of Gas and Oil maintains a computerized well data system. The system may be used to retrieve information on any particular well. Drilling, completion and production data are entered into an automated system. Reports can be run with selected search criteria.
- West Virginia** Various databases are utilized for the state's oil and gas production information. The Office of Oil and Gas uses Excel, ArcView, and ERIS. The information is reported monthly by well and operator, and the operator may file information on diskette. All wells, even nonproducing wells, must file production reports. Information is menu driven and is accessed through the Web.
- Wyoming** Databases include: well production; plant production; well records; injection well records; unit areas; well spacing and Commission orders; bonding information; water analyses and water wells; core information; and communitization and

### **Data Collection and Management Methods**

participating areas. Information is available from the Wyoming Oil and Gas Conservation Commission through an office network on personal computers and most automated files are also available through the Internet.



## **F. SALVAGE VALUE OF ORPHAN WELLS**

Even though wells have been orphaned, they potentially have an asset value. Any lease equipment or hydrocarbons left in storage tanks on the lease may have value, and the hydrocarbons left in the reservoir also could be potentially viewed as an asset. Orphan wells also represent a liability to the state, since in many cases inadequate or no security exists to cover the cost of plugging. Even where security exists, the state often must plug the well first, then attempt to claim the security. Wells in poor condition can pose further liability where human health or the environment could be endangered.

States were asked by the IOGCC survey if they determine the asset value of wells prior to plugging them. Most states are able to recover, through a variety of mechanisms, the asset value of any equipment or hydrocarbons remaining on the lease to offset the costs of plugging the well, although in many cases operators have removed virtually all salvageable equipment prior to abandoning the well. Three states with oil or gas production indicated that they attempt to determine whether the hydrocarbons remaining in the reservoir have any value. Arizona checks the wells to be plugged to ascertain if there is potential for enhanced recovery or for other uses. Nebraska evaluates wells prior to plugging to determine if the well has any remaining potential. In Utah, operators in adjacent areas may be contacted regarding interest in taking over the orphan well. Most states probably do not make this evaluation for several reasons: a new lease would likely need to be negotiated before another operator could use the well to access the reservoir, future economic conditions and technology may dictate the feasibility of recovering those “assets” in the reservoir, and without economic benefit to the state, allocation of staff resources to this evaluation is not prudent. Texas does have an innovative program to try to save for future hydrocarbon recovery older wells that might otherwise be abandoned (described in Section IV), but this program was not designed for orphan wells.

For the states included in this study, only the salvage value of equipment and hydrocarbons left at the well site are determined for wells scheduled for state-funded plugging. Most states have some form of a salvage program. However, the salvage value of a state-funded well plugging typically offsets only a portion of the well-plugging costs. Texas, by far the most active state plugging program (see Section III–C), has encountered less than 25 wells where the equipment salvage value was greater than the plugging costs. Since wells left for state plugging are often older wells, the equipment may have little or no resale value, and the only remaining value is typically from scrap metal.

The salvage value of equipment sold from state-funded well pluggings is determined by most states as part of a combined salvage and well-plugging bidding process. With a few exceptions, most states reduce their well-plugging costs by allowing well-plugging contractors to retain possession of the equipment in lieu of selling the equipment separately and depositing the proceeds in the state’s general revenue fund or well-plugging fund. In many states, this approach is far simpler than having a separate salvage program due to state procurement requirements and the ease of dealing with both plugging and salvage in a single contract. The following is a summary of the approach to salvage in each state with some form of salvage program or asset value determination process.

## Salvage Value of Orphan Wells

<b>Alaska</b>	Evaluation criteria for determining a well's asset value are whether or not a well may serve as a producing or a service well. Wells with high risks of damaging the integrity of freshwater or hydrocarbon zones are plugged with state funds, regardless of the well's asset value.
<b>Arkansas</b>	A well's salvage value is determined by the plugging contractor as part of the bidding process on wells plugged with state funds. Any equipment left on site may be retained by the plugging contractor.
<b>California</b>	Salvage value determination for a well plugged with state funds is considered in the bidding process using the formula " <i>Cost to plug the well – salvage value = net cost to the state.</i> " This approach may reduce significantly the cost to the state.
<b>Colorado</b>	When a project to plug a well is put out to bid by contractors, tubulars and equipment salvage rates are also included with the bid. Actual salvage amounts are also subtracted from the final invoice.
<b>Illinois</b>	Salvage disposition established by statute. Salvage can be used by the state to offset plugging costs or can be sold by private sale. All proceeds from sales go into the State Plugging Fund. Salvage costs are established by rule and are generally made part of the plugging contract and deducted from the amount paid to the contractor. The major problem encountered has been resolving outstanding liens filed prior to a Department plugging order.
<b>Kansas</b>	Value determination on wells plugged with state funds is strictly the salvage value of the equipment left on location. The equipment value is determined by bidding the equipment separately from the well plugging bid process or included in the bid negotiations for plugging services provided by the plugging contractor. Any cost recovery to the Conservation Fee Fund is considered important to the success of the overall program. Limitations to the salvage program in the past have been associated with the cost of litigation to secure title to equipment and in recent years the low overall value of oilfield equipment.
<b>Kentucky</b>	Equipment from a state-bid well is advertised in the newspaper for claims. A list of the equipment and a description of the equipment's condition are then mailed to bidders. The highest bidder claims the equipment.
<b>Louisiana</b>	Salvage value of a well scheduled for plugging with state funds is included in the bidding process for a state-funded well plugging operation.
<b>Michigan</b>	Only salvage value determination is made on wells scheduled for plugging with state funds. The salvage program was initiated in fiscal year 1996. A

## Salvage Value of Orphan Wells

minimum of three bids are requested. The highest bidder gets the contract. Proceeds from the sale of salvageable equipment are deposited into the Orphan Well Fund.

- Mississippi** Salvage value determination is provided for in the contract to plug wells with state funds.
- Missouri** Salvage value of wells scheduled for plugging with state funds is incorporated into the well plugging bidding process to reduce a contractor's bid and make the bids more competitive.
- Nebraska** Tangible items may be sold to the well service contractor or credited to contractor to offset the cost to plug and abandon the well
- New Mexico** Plugging contractors are authorized to sell the equipment and material removed from the well site during plugging for salvage. The value of the salvageable equipment affects the bid price by reducing the cost to the state.
- North Dakota** In cases where there is salvageable equipment for a well plugged with state funds, the equipment is confiscated and sold to recoup a portion of plugging costs..
- Ohio** The plugging contractor offsets plugging costs with the value of any salvageable equipment or pipe.
- Oklahoma** The agency has the authority to file liens on wells that are required to be plugged, but has not filed any because these are not priority liens. Most of the equipment associated with state funded plugging activities is junk and quite literally trash and debris. Some casing is pulled and can be salvaged, but the state does not receive the proceeds from the sale of such except if it is considered in the state-funded well plugging bid process by the well plugger and the Commission. All rods, tubing and other downhole equipment is generally stripped from the well prior to the well being placed on the "orphaned well" list.
- Pennsylvania** Only salvage value on wells plugged with state funds is determined. However, the salvage value is either minimal or non-existent due to the deteriorated condition of most wells plugged with state funds.
- Texas** The sale of hydrocarbons and equipment from wells plugged with state funds was authorized by House Bill 2705 in 1994. The main provision of the Salvage Program is that potential claimants have an indefinite time period in which to file a claim against the proceeds derived from the sale. A certified notice must be sent to the operator of the well 30 days prior to entering into a plugging contract. The certified notice gives the operator one final opportunity to plug the well. This notice also is sent to the county clerk of the county in which the well is located for recording in the real property records. The notice advised the operator that if the well is plugged with state funds,

## **Salvage Value of Orphan Wells**

the Commission may dispose of all equipment and hydrocarbons on the lease under the provision authorized by statute. Within 30 days after the sale, a second notice is sent to the operator of the well advising the operator of what was sold. This notice also serves as the bill of sale for the purchaser of the equipment or hydrocarbons. Within 180 days after the sale, the Commission must publish a notice of what was sold in a newspaper of general circulation in the county in which the well is located. Potential claimants have unlimited time in which to file a claim. Claims made by or on behalf of the operator are offset against any unreimbursed expenditure paid from the Oil Field Cleanup Fund. Well plugging salvage companies routinely screen wells approved for plugging with state funds to determine if wells have sufficient equipment to offset plugging costs. If this is the case, the salvage plugging companies will take over operating responsibility for these wells and plug them for the salvage value. Since the inception of the Salvage Program in May, 1994, through December, 1999, the Commission has conducted 1,344 salvage operations and deposited \$3,731,890 into the Oil Field Cleanup Fund.

- Utah*** In the event salvageable equipment is encountered, the salvage value would be negotiated out of the plugging contractor's well plugging costs, on a case-by-case basis.
- West Virginia*** Equipment salvaged from state-funded well pluggings is retained by the well plugging contractor. However, most wells do not have any equipment left at the site.
- Wyoming*** Chapter 5, Section 18 of the agency's rules provides that when oil field equipment on a lease where the well is located is abandoned, the Commission may deem it so and transfer title of the equipment to the person who plugs the well, reclaims the drill site, or who will remove the equipment. The rule includes notice provisions. After 30 days notice is provided to lien holders, little useable equipment remains.

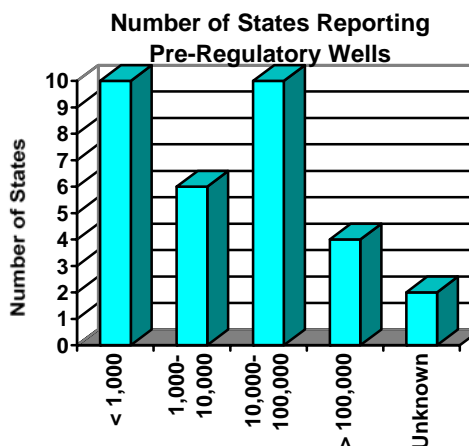
## **G. PRE-REGULATORY WELLS**

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 a few 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 may be uncertain.

None of the 32 states submitting responses to the IOGCC idle well questionnaire enacted rules or statutes pertaining to the exploration for or the production of oil and gas until after such activities commenced in the state. On average, 60 years elapsed between the drilling of the first exploratory well and the establishment of a formal regulatory system. Florida began regulating oil and gas exploration only one year following the drilling of the first exploration well. Three states: Mississippi, New Mexico, and Oklahoma, established regulations approximately 20 years after the first well was drilled. Four states: Kentucky, Missouri, New York, and Ohio, waited as long as 100 years after exploration commenced to establish a formal regulatory system. Some states reported that although a regulatory authority was not established to govern the production of oil and gas, some form of regulation or reporting requirement did exist via the state's Geological Survey or engineer's office. In New York, for example, a law requiring plugging of abandoned wells was passed in 1879, even though a formal oil and gas regulatory authority was not established until 1963. This allowed these states to control some drilling activities and protect their ground-water resources, or at least better identify wells and potential problems.

Estimates of the total number of pre-regulatory wells range from 828,352 to 1,062,433, based on the responses from 32 states. Kansas, Ohio, Pennsylvania, and Texas each reported that more than 100,000 wells might have been drilled prior to the enactment of state regulations. Colorado and Florida do not have an estimate of the number of pre-regulatory wells drilled in their state.



Once the regulatory authority was created, wells previously drilled generally became subject to state regulation. In a few states, pre-regulatory wells were “grandfathered” and exempted from financial security and spacing requirements. This limited jurisdictional authority extended until the well ownership changed. Then the well became subject to full regulatory authority.

Records of pre-regulatory drilling activities were transferred to the new state authority for incorporation into its well files. In most instances, states do not maintain a separate filing system to identify pre-regulatory wells. States that have their well records available for use in a digital data management system may be able to identify pre-regulatory wells by the drill dates recorded or other identifiable characteristics. However, most states reported having only limited information on pre-regulatory wells. Efforts to gather data for these wells have varied, but most states have employed field investigations, archival searches, commercial scout tickets, historic field maps, and owner/operator records. Some states reported that they can account for every well drilled; others have little, if any, information on most pre-regulatory wells. Maryland reported that location of information on pre-regulatory wells was very important, but that time limitations allow only minimal search efforts.

If a state knows the location of a pre-regulatory well, it can determine the approximate total depth and target formation and whether the well had established production. States may be able to determine the owner/operator, well name and number, and other pertinent information. Since these wells were drilled and possibly plugged and/or abandoned prior to an established regulatory program, states lack the construction history for most of these wells. In many states, casing and cementing programs were not yet required to protect ground water resources, and some older wells have occasionally posed a risk to ground water (see Section III-I). However, if the wells were still producing at the time the regulatory authority gained jurisdiction, the owner/operator was required to file reports pertaining to the well's construction and production. The wells were also subject to state plugging regulations and ground water protection requirements at the time of abandonment.

Most states now have jurisdiction over all wells drilled for oil and gas exploration and production purposes, whether or not the well pre-dates regulatory authority. All but seven states reported that they currently have full or partial jurisdiction by statute over pre-regulatory wells. Two of these states — Illinois and Missouri — have only jurisdiction for those wells that were active when the regulatory authority was established. Of the states included in this survey, there is only one which does not have jurisdiction over pre-regulatory wells. Tennessee has 3,179 pre-regulatory wells, but has jurisdiction only if the wells are a threat to the environment. Tennessee reported that when the operator of a pre-regulatory well can be located, the state will use regulatory pressure to effect plugging and abandonment of the well if necessary. Since the 1996 survey, North Dakota placed pre-regulatory gas wells under current statutes and rules. All other states report that they have the ability to take care of any problems that may be caused by pre-regulatory wells, either by using regulatory avenues available in their state (if a financially viable responsible party can be identified) or through the use of state funds in the form of an established well plugging fund.

Although the number of pre-regulatory wells drilled could exceed one million, many of these wells have long been plugged and abandoned safely. Other such wells may still be producing or are currently idle. States are generally aware of these wells and many have taken significant steps to identify locations, owner/operators, construction, and current well status. State mechanisms for plugging pre-regulatory wells exist when the owner or operator cannot be identified. Through these mechanisms, states are actively working to ensure that pre-regulatory wells do not pose a risk to human health or the environment. The following summarizes the authority of the states for pre-regulatory wells.

### **Authority for Pre-Regulatory Wells**

#### ***Alabama***

During approximately 80 years of pre-regulatory exploration and production activity in Alabama, about 325 wells were drilled. When the regulatory structure was established, the few remaining active wells were brought under regulatory jurisdiction. All existing information for pre-regulatory wells was cataloged and published by the Alabama Geological Survey. This information consists primarily of drillers' logs with well cuttings and cores,

## **Authority for Pre-Regulatory Wells**

electric logs, and well construction information for some wells. Alabama maintains a separate designation for pre-regulatory wells. All wells requiring plugging or that are temporarily abandoned, including those drilled prior to regulation, fall under the regulatory jurisdiction of the Oil and Gas Board.

### ***Alaska***

Oil and gas exploration began in Alaska with oil claims staked in 1867. The first well was drilled in 1898 and the first production was established in 1902. Alaska's regulatory program began in 1958. During the 60 years of pre-state regulatory activity, 189 wells were recorded as drilled, but the state agency estimates that 239 wells were actually drilled. An estimated 140 of those pre-regulatory wells have been plugged. All pre-regulatory wells were brought under jurisdiction of the Alaska Oil and Gas Conservation Commission with the initiation of the regulatory program. Historical record searches and correspondence with other state and federal agencies are two methods Alaska has used to gather information on pre-regulatory wells. All pre-regulatory wells are of interest regardless of their status. There is a continuing effort to gather information such as: name of the operator; location; and condition of well. If pre-regulatory wells require plugging, they are treated in the same manner as post-regulatory wells.

### ***Arizona***

The Oil and Gas Conservation Act of 1951 established the regulatory structure for Arizona. The Oil and Gas Conservation Commission was established in 1959. Arizona had 46 years of activity before the establishment of its regulatory authority and 54 years before the creation of its current regulatory structure. During this time, 210 wells were drilled. The Arizona Oil and Gas Conservation Commission has regulatory authority over these pre-regulatory wells. Arizona has information concerning all 210 pre-regulatory wells developed through newspaper accounts, published reports, direct contacts, field checks, word-of-mouth, etc. This information includes location, elevation, total depth, geologic data, scout tickets, testimonials, and other information that was available. Arizona does not maintain a separate list for pre-regulatory wells. Although there are no known pre-regulatory wells that require plugging, A.R.S. 27-524(E) allows the Commission to establish owner liability and to sue the well owner for the cost of plugging and abandonment of a well.

### ***Arkansas***

The first well in Arkansas was drilled in 1901 and the first commercial production was recorded in 1921. There were 9,407 wells drilled prior to the establishment of regulations in 1939 (the first permit was issued in 1923). All of these pre-regulatory wells were brought under regulatory jurisdiction. Arkansas does not maintain a separate listing for these wells. The guidelines for pre-regulatory wells are the same as those for wells drilled after the establishment of the regulatory program.

## Authority for Pre-Regulatory Wells

- California** Thirty-nine years of pre-regulatory activity occurred in California. The first wells were drilled in 1876 and the regulatory authority was established in 1915. The 12,796 wells drilled during this time were all brought under regulatory jurisdiction. Records for pre-regulatory wells were obtained from the counties that were conducting regulatory activities at the time. These records included active, inactive, and plugged wells. In many cases, complete well records were available. In some cases, nothing more than a well name, number, and location were available. California does not maintain a separate listing for pre-regulatory wells. Regulatory avenues are available to the state to resolve any problems associated with pre-regulatory wells.
- Colorado** Colorado established its regulatory program in 1951, and the Oil and Gas Conservation Commission has no record of how many wells were drilled in the 89 years of activity prior to this date, even though all wells were brought under that entity's jurisdiction. All wells that were still producing in 1952 are accounted for, but the Commission has no information pertaining to the other pre-regulatory wells. The Oil and Gas Conservation Commission does have an "Environmental Response Fund," established under CRS 34-60-124, to handle any environmental problems that may occur with orphaned pre-regulatory wells. If the well is not orphaned, the operator is responsible for completing the well's life cycle. Colorado does not have a separate listing for pre-regulatory wells.
- Florida** Oil and gas exploration was conducted in Florida for approximately one year prior to the state's establishment of a regulatory program in 1945. Records of the brief pre-regulatory period are very limited. All available information on pre-regulatory wells was collected and entered into the Florida Geological Survey database. The data is very basic and consists of well name, location, operator, very brief well construction data, and sample description.
- Illinois** Production first occurred in Illinois in 1905 and the first regulatory authority was established in 1939. The Illinois Department of Natural Resources, Division of Oil and Gas, estimates that 30,000 wells were drilled during this 35-year window. Of those pre-regulatory wells, Illinois estimates that approximately 27,000 have been plugged and abandoned. Initially, pre-regulatory wells were not included in the 1939 legislation enacting regulatory jurisdiction. The Act was amended in 1990 to require all remaining, existing pre-law wells to be permitted by the current owner of the lease on which the pre-law well existed. The Department conducted inspections of each lease to locate all unpermitted, pre-law wells. Pre-law wells plugged prior to regulation in 1939 are shown on maps compiled by the State Geological Survey. All active and inactive wells were located but no attempt was made to locate pre-law wells that were previously plugged. From this inspection effort and previous information, all visible pre-law wells are included in the Department's database. Illinois does not maintain a separate listing for these wells. All wells, whether pre-regulatory or not, are



## Authority for Pre-Regulatory Wells

treated equally under the regulatory program.

### ***Indiana***

Regulatory controls for oil and gas activities in Indiana were authorized in 1947, but those activities began in the mid-1880s. During this time, the Department of Natural Resources estimates that between 24,000 and 30,000 wells were drilled. These wells were grandfathered when regulations were established, but remained so only until the well ownership changed. No formal survey was conducted by the Department to identify or gather information on these pre-regulatory wells, but the Indiana Geological Survey has historic information for many of the wells. The state maintains a large number of paper records but, typically, most of the information is limited to location, lease or property name, and elevation. Pre-regulatory well information is not maintained in a separate file. Should problems occur with pre-regulatory wells, the Department may use money from forfeited bonds or environmental funds to plug and abandon the wells.

### ***Kansas***

Although the Kansas Corporation Commission does not know the exact date for the state's first drilling activity, it believes it occurred in the fall of 1860. This translates to about 72 years of exploration and production activity prior to regulation. There is no accurate way to assess the total activity prior to regulation, but based on production data, the KCC estimates that between 125,000 and 150,000 wells were drilled prior to regulatory authority. All pre-regulatory wells were brought under the KCC's jurisdiction by statute. Control over plugging operations began in 1935. During the development of the existing injection/disposal well inventory and with the API well numbering project under way, in-house inventories were conducted from routine inspections for active and inactive wells. The KCC maintains a library for all well pluggings since the imposition of regulation. Within this library, some pre-regulatory well information is available. Vendor database information and scout data have been merged into the Division's current database systems and contain some pre-regulatory records. Much of the hard copy data needs to be reconciled with electronic data. By statute, pre-regulatory wells came under the jurisdiction of the KCC and, therefore, are subject to the same regulatory process as wells drilled prior to regulation. Funds from both the Conservation Fee Fund and the Abandoned Well / Site Remediation Fund are available to plug orphaned pre-regulatory wells.

### ***Kentucky***

In 1818, the first exploratory well was drilled in Kentucky. The well was actually drilled for salt water but started producing oil in commercial quantities. Full scale drilling activities for oil and gas commenced in the mid 1850s, but no published production data were available prior to 1883. Based on data received from the Kentucky Geological Survey, the Department of Mines and Minerals estimates that between 60,000 and 70,000 wells were drilled in the 100 years before regulation. In 1960, the department was provided statutory jurisdiction for pre-regulatory wells, but these wells were not required to be covered by financial security for plugging. The Kentucky Geological Survey gathered records from operating entities for years, and scout tickets and old production maps provide much information. Among

## Authority for Pre-Regulatory Wells

these data, at least some information on most pre-regulatory wells is available. Kentucky does not maintain a separate list of pre-regulatory wells. When a pre-regulatory well is to be plugged, the Department places it in violation and plugs it using state funds. Pre-regulatory wells are treated the same as post-regulatory wells when temporary abandonment is requested.

### ***Louisiana***

The first well drilled in Louisiana was near the town of Jennings, and began production on September 21, 1901. The Louisiana Office of Conservation was created in 1912 by Act 127. Comprehensive statutory authority to regulate exploration and production activity in Louisiana was provided by Act 157 in 1940. Prior to that act, certain oil and gas activities were regulated by the Department of Minerals, now part of the Office of Conservation. The Office of Conservation issued its first order affecting oil and gas activities in 1941. The 24,714 wells drilled prior to 1941 are considered pre-regulatory, but were brought under the jurisdiction of the Office of Conservation. The only information available to the Office of Conservation on these wells is that submitted by the operator of record when regulation began. Information is limited to: permit; location; well name and number; operator name; and other superficial data. No separate listing is available of pre-regulatory wells. The Office of Conservation requires that the operator of record be responsible for plugging and abandonment.

### ***Maryland***

The first laws regulating oil and gas exploration in Maryland were passed in 1954, 49 years after the first exploration well was drilled. About 116 wells were drilled prior to this date. The statutes governing oil and gas brought these wells under the state regulatory authority. Maryland has accounted for all 116 wells by location, but other information is sparse. Only minimal efforts have been made toward seeking more information due to time constraints. Pre-law wells are included in the state's well database. There were no provisions for plugging pre-regulatory wells, but if they were still producing in 1954, well operators were required to post performance bonds and follow all applicable regulations.

### ***Michigan***

Exploration activities are recorded as early as 1863 in Michigan, with documented production commencing in 1886. Regulation began in 1927. During the 64 years of pre-regulatory activity an estimated 300 producing wells and 4,000 dry holes were drilled. Those wells were brought under the regulatory authority of the state. There is no ongoing effort to identify or gather information on pre-regulatory wells. If a pre-regulatory well is located due to surface or subsurface evidence of leakage, local records will be searched in order to identify the well. Some old records exist with limited data, but there is no comprehensive compilation of this information. Old geologic reports, newspaper accounts, and other informal sources are used to create well records. There is no separate listing for pre-regulatory wells. The Department of Environmental Quality has used Part 616, the Orphan Well Fund, and Part 201, Environmental Remediation Funds, to handle

## Authority for Pre-Regulatory Wells

replugging of pre-regulatory wells.

### **Mississippi**

The Oil and Gas Board of Mississippi was formed in 1948. The first exploratory activities began in 1929. During these 20 years, approximately 6,000 wells were drilled. All pre-regulatory wells were brought under the jurisdiction of the Board. The Board has files on most of the wells and at the least, the locations of the rest, including wells plugged and abandoned prior to regulation. If a pre-regulatory well needs to be plugged and is declared orphaned by the Board, the well is plugged with Oil and Gas Board funds.

### **Missouri**

Missouri estimates that between 5,000 to 6,000 wells were drilled prior to regulation; 4,943 wells are on file. Only when wells or leases are placed back into production does regulatory jurisdiction exist. A search was made through archives, scout tickets, and publications for all wells regardless of status, and additional wells are added to the well files as they are encountered in the field. A database file is maintained with as much information as is available for each well. Separate hard copy and log files also are kept for information that is not readily adapted to the database format. Those pre-regulatory wells that are in Missouri's files have an API number beginning with "0," while the post-regulatory wells begin with a "2." Pre-regulatory wells that have been re-entered after regulation may exist in duplicate on the database. At present, only wells that pose a threat to human life or habitation or a significant threat to the environment are plugged using state funds. A procedure is being considered to require the plugging of all abandoned wells prior to the sale of any lease.

### **Montana**

About 6,000 to 8,000 pre-regulatory wells were drilled during the approximately 40 years of activity in Montana before regulations were established in 1954. All such wells were brought under the regulatory authority's requirements, except for well spacing. Montana maintains files on all known wells, with any available information. No separate listing is available for pre-regulatory wells. When plugging or temporary abandonment is necessary, the pre-regulatory wells are treated equally with post-regulatory wells.

### **Nebraska**

Nebraska's approximately 6,056 pre-regulatory wells came under state jurisdiction when enabling statutes were passed approximately 70 years after initial exploration activities. The Nebraska Conservation and Survey Division began collecting well information in 1912 and issuing drilling permits in 1951. On September 28, 1959, the Nebraska Oil and Gas Conservation Commission was established. The commission believes that every well drilled is accounted for in its records. Most wells have files, but wells drilled prior to 1939 may not. Of the 6,056 wells drilled, 3,063 were dry holes and 325 have been plugged and abandoned. The Commission has available logs, sample descriptions, and scout tickets for most wells drilled prior to 1951. All existing data on pre-regulatory wells has been entered into the RBDMS. Pre-regulatory wells are treated the same as post-regulatory

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wells for regulatory purposes.

- Nevada*** Oil and gas exploration began in Nevada as far back as 1919. The Nevada Oil and Gas Conservation Commission was created in 1953. General rules and regulations of the NOGCC were adopted in 1954. The State Water Engineer regulated oil and gas activities prior to this time. Only about 44 wells were drilled prior to state regulation. All pre-regulatory wells have been plugged and abandoned. The Division of Minerals has all the basic completion information pertaining to those wells. Information on pre-regulatory wells was gathered through the combined efforts of the Division of Resources and the Bureau of Mines and Geology. No separate listing is maintained for pre-regulatory wells.
- New Mexico*** The first oil and gas well was drilled in New Mexico in 1911. The first commercial well was established in 1928. All wells in New Mexico were brought into compliance with the regulatory programs that commenced in 1935. An estimated 10,000 wells were drilled prior to regulatory statutes. Of the number of pre-regulatory wells, almost all have been plugged and abandoned. The New Mexico Bureau of Mines maintains files on pre-regulatory wells.
- New York*** In New York, the first natural gas well was drilled in 1821 and the first oil production was established in 1865. A law was passed in 1879 requiring owners to plug abandoned wells, and a comprehensive regulatory program was implemented in 1963. About 55,000 wells were drilled prior to the comprehensive regulatory program. The enabling statutes of 1963 followed by the 1967 rules subjected all wells to regulatory control. Pre-regulatory wells were exempted from certain financial security requirements. Efforts to gather information on pre-regulatory wells included a review of old records, requests to owners and operators to identify wells, and field inspections. This information was sought on all active, inactive, and plugged wells. These data are available but not listed separately for pre-regulatory wells. Statutory abandonment and plugging responsibilities apply to all wells.
- North Dakota*** About 39 pre-regulatory gas wells were drilled prior to the establishment of rules in 1941. Of the pre-regulatory wells drilled, 20 have been plugged and abandoned. Information is maintained on pre-regulatory gas wells. Well information on pre-regulatory wells was gathered from the operators. All active pre-regulatory gas wells are bonded and subject to current statutes and rules. North Dakota does not maintain a separate listing for pre-regulatory wells.
- Ohio*** About 105 years of pre-regulatory activity occurred in Ohio. The first commercial oil and gas well was completed in 1860. Beginning in 1898, oil and gas wells were under the jurisdiction of the Division of Mines. In 1965, the Division of Oil and Gas was created as the primary authority. There were 185,850 pre-regulatory wells drilled. Of the total, 42,067 were drilled between 1860 and 1897. The number of these wells plugged and

## **Authority for Pre-Regulatory Wells**

abandoned is unknown. When the Division of Oil and Gas was created, the records of the Division of Mines were transferred to the new regulating authority. In an effort to gather records on pre-regulatory wells, the ODNR, Division of Geological Survey purchased records pertaining to wells drilled prior to Division of Mines or Division of Oil and Gas authority. The state maintains location, completion, plugging, and production data for pre-regulatory wells. Ohio does not maintain a separate listing for pre-regulatory wells.

### ***Oklahoma***

Twenty years of oil and gas exploration and production occurred in Oklahoma prior to regulation, which resulted in 50,000 pre-regulatory wells. All these wells were brought under the jurisdiction of the Oklahoma Corporation Commission statutorily in 1915. The first rules of the OCC regarding oil and gas were established in 1917. Of the 50,000 pre-regulatory wells drilled, 40,000 have been plugged and abandoned. If a pre-regulatory well was still active when the OCC gained jurisdiction, the operator was required to file all completion and production records with the Commission. If the pre-regulatory well had been plugged and/or abandoned, little or no information was received. However, the Oklahoma Geological Survey received voluntary well drilling and completion reports for many pre-regulatory wells at the time of completion. These reports are available to the Commission, and have been entered into a data management system that includes all post-regulatory wells. The system allows retrieval of wells via drill dates; thus an electronic listing is available of known pre-regulatory wells. All hard copy records for pre-regulatory wells are merged with post-regulatory wells. The Corporation Commission has exclusive regulatory authority over all wells in Oklahoma, and makes no distinction between pre- and post-regulatory wells for regulatory purposes.

### ***Pennsylvania***

The first well in Pennsylvania was drilled in 1859 and the first requirement to plug was issued in the 1890s. Pennsylvania issued permits to drill through coal seams in 1956, and to drill all wells in 1963. In 1985, all wells not previously permitted were required to be registered and nonproducing wells were required to obtain an inactive regulatory status or be plugged. Pennsylvania has documented 33,364 pre-regulatory wells, but estimates that the total number may approach 200,000 wells. All wells fall under the jurisdiction of the Pennsylvania Department of Environmental Protection. Pre-act wells are required to be registered, which provides well location information. All wells not plugged must provide an annual production report with the operational status of each well. The state maintains computerized and paper files with available information on all known wells, but pre-regulatory wells are not separately identified. If the well is operating and has not been registered, the Department can request information from the operator. If the Department is unable to determine the operator and the well is not registered or the well is abandoned with no known operator, the state can plug the well using state plugging funds.

## Authority for Pre-Regulatory Wells

- South Dakota** Fewer than 100 wells were drilled in South Dakota prior to the beginning of regulation in 1943. Approximately 50 of the wells drilled prior to regulation have been plugged and abandoned. Logs of some of the pre-regulatory wells were filed with the State Geologist or the State Engineer. The State Engineer's Office required certain information on all wells drilled, not just oil and gas wells. Much information is published in its biennial reports, and many early-day oil and gas wells were converted to water wells. Most pre-regulatory well files are sketchy, and no separate listing exists for such wells. The State Engineer's Office has received special funding (appropriations) over the years to plug a number of the most environmentally unsound wells.
- Tennessee** At least 50 to 60 years of exploration and production occurred in Tennessee prior to regulation. During this time, 3,179 wells were drilled. These wells were not brought under regulatory jurisdiction. In past years, several surveys were conducted to locate and identify pre-regulatory wells. Records have been maintained on all available wells by the Tennessee Division of Geology. The records include location, total depth, current status, casing program, and production information. Tennessee maintains this file separately from post-regulatory wells. In 1987, a reclamation fund was established to provide funding (acquired through assessed penalties) for plugging and reclaiming abandoned wells. These funds may be used on pre-regulatory wells.
- Texas** Production began in Texas in 1859, and the oil and gas regulatory program was established in 1919. During these 60 years of activity, the Texas Railroad Commission estimates 113,000 wells were drilled. This estimate is made through the total number of permitted locations on the Commission's computer mapping system, minus the number of permitted wells known not to have been drilled, minus the number of wells known to have been drilled since 1939 when consistent records began. The Texas Legislature included regulation of all oil and gas activities under the jurisdiction of the Railroad Commission, including pre-regulatory wells. The Commission has been developing a comprehensive mapping system to identify all of the wells drilled prior to and since the commencement of regulatory efforts. Many of the pre-regulatory well locations are from old maps and old scout cards received from major oil companies. Only the operator names, well numbers, well locations, and total depths are known for the wells identified from the maps. The scout card information contains casing size and depth, perforations, lease names, and dates of activities. The information for pre-regulatory wells is maintained in a merged file with post-regulatory wells. Typically, pre-regulatory wells were plugged in accordance with the standards of that time. The operators are usually no longer active in the state. However, some current active operators may be successor companies to the older entities. If a pre-regulatory well is determined to require plugging, efforts are made to identify the operator and determine the company's current status. If the operator is not identified or is no longer active, the well is plugged with state funds without seeking reimbursement.

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If the operator is a predecessor company to a currently active operator, the current operator is requested to plug the well or reimburse the state for the plugging expense. If the operator refuses, penalties are sought through the Attorney General's Office.

### ***Utah***

The first drilling for oil and gas in Utah was in 1891. The state's regulatory program was initiated in 1955. Approximately 900 wells were drilled in Utah in the 60-plus years of activity prior to regulation. These wells were brought under regulatory jurisdiction and the state has some information on them all. It is believed most of the pre-regulatory wells drilled in Utah have been plugged and abandoned, but the exact number is unknown. Utah has compiled certain out-of-print publications (bulletins) which identify many of the wells drilled prior to regulation. These bulletins include well location, date drilled, depth formations encountered, operator names, and some wellbore mechanical information. The bulletins are no longer printed, but file copies are maintained at the Division office in Salt Lake City. Utah does not maintain separate files for pre-regulatory wells. All regulations apply to pre-regulatory wells. If problems should occur, the state may plug the wells using its plugging fund.

### ***Virginia***

Virginia began its regulatory efforts in 1950. The first exploration effort began in the late 1890s. During the 50-plus years, 157 wells were drilled, and they were brought under the state's jurisdiction. The 1990 Virginia Gas and Oil Act established an Orphan Well Program for wells drilled prior to 1950 (without bonding or security requirements). Records show 100–120 of the pre-regulatory wells have been plugged and abandoned. Historical and file data on drilling, completion, plugging, and production are maintained by both the Division of Gas and Oil and the Division of Mineral Resources. This information includes total depth, zones of completion, well locations, and other pertinent information. The Division does not keep a separate listing for pre-regulatory wells, but one could be developed. The Orphan Well Fund, established to plug the remaining pre-regulatory wells, is funded through an assessment fee placed on new permit applications.

### ***West Virginia***

Approximately 50,000 pre-regulatory wells were drilled in West Virginia. These wells were drilled over approximately 75 years of activity before formal regulations were established in 1929. When the state enabled its Office of Oil and Gas to regulate exploration and production activity, these pre-regulatory wells were not included. West Virginia since has extended its regulatory authority to include these wells, through the Abandoned Well Act. Pre-regulatory wells are treated the same as post-regulatory wells by the Office.

### ***Wyoming***

The Wyoming Oil and Gas Conservation Commission (WOGCC) was established in 1951. Wyoming's first successful well was drilled 67 years previously, in 1884. In 1902, the Wyoming Legislature established the Office of the State Geologist. In 1919, the State Geologist was charged with enforcing laws relating to the oil industry, and in 1921, he was empowered

### **Authority for Pre-Regulatory Wells**

to set and enforce rules. The exact number of pre-regulatory wells drilled is unknown, but is estimated at 15,000 to 30,000 wells. Early development (prior to 1951) was recorded and monitored by both the state and federal governmental entities. Federal mineral leases account for 65 percent of the land in the state. In 1944, the U.S. Geological Survey published an inventory of 9,152 wells that became part of the current agency's records. After 1931, the State Geologist accumulated technical information on oil and gas wells and those records likewise have been incorporated. There was also a Mineral Supervisor who monitored oil field activity and inspected producing properties on state leases. Pre-regulatory wells came under the WOGCC's jurisdiction by statute in 1951. The above-mentioned files, along with files from the U.S. Department of the Interior, Bureau of Land Management, were incorporated into the state's files. The WOGCC seeks to maintain a complete and accurate history on each well drilled in the state. The files include information on all wells, whether active, inactive, or plugged, and whether on private, state, reservation, or federal lands. These files include information pertaining to drilling, completion, logs, driller's logs, correspondence, and plugging procedures. All information is maintained in one comprehensive data management system. If a problem occurs with a pre-regulatory well, the WOGCC determines if a company now bonded for other wells in the state had an interest in the problem well. If so, that entity is requested to plug the well. If no currently bonded entity is found, the state plugs the well and places a lien on the equipment, if any.

Table IV summarizes information about pre-regulatory wells and state authority for regulating them.



**Table IV. Pre-Regulatory Wells**

State	Pre-Regulatory Activity	First Regulation	Approximate # of Years of Pre-Reg. Activity	# of Pre-Regulatory Wells (Low)	# Of Pre-Regulatory Wells (High)	Pre-Regulatory Wells Under Full or Partial Jurisdiction	Pre-Regulatory Well Files Maintained Separately	Regulatory Avenues Available on Pre-Regulatory Wells
Alabama	Yes	1945	80	325	325	Yes	Yes	All
Alaska	Yes	1958	60	189	240	Yes	No	P&A Only*
Arizona	Yes	1954	54	210	210	Yes	No	P&A Only*
Arkansas	Yes	1939	38	9,407	9,407	Yes	No	All
California	Yes	1915	39	12,796	12,796	Yes	No	All
Colorado	Yes	1951	89	Unknown	Unknown	Yes	No	P&A Only*
Florida	Yes	1945	1	Unknown	Unknown	Yes	No	All
Illinois	Yes	1939	35	30,000	30,000	Yes	No	All
Indiana	Yes	1947	61	24,000	30,000	Yes	No	P&A Only*
Kansas	Yes	1933	73	125,000	150,000	Yes	No	All
Kentucky	Yes	1960	100	60,000	70,000	Yes	No	All
Louisiana	Yes	1941	40	24,714	24,714	Yes	No	P&A Only*
Maryland	Yes	1954	49	116	116	Yes	No	All
Michigan	Yes	1927	64	300	300	Yes	No	P&A Only*
Mississippi	Yes	1948	20	6,000	6,000	Yes	No	P&A Only*
Missouri	Yes	1966	100	5,000	6,000	Active Only	Yes	P&A Only*
Montana	Yes	1954	50	6,000	8,000	Yes	No	All
Nebraska	Yes	1959	70	6,056	6,056	Yes	No	All
Nevada	Yes	1954	35	44	44	Yes	No	n/a
New Mexico	Yes	1935	24	10,000	10,000	Yes	No	P&A Only*
New York	Yes	1963	108	55,000	65,000	Yes	No	All
North Dakota	Yes	1941	Unknown	39	39	Yes <sup>a</sup>	No	All
Ohio	Yes	1965	105	185,850	185,850	Yes	No	P&A Only*
Oklahoma	Yes	1915	20	50,000	50,000	Yes	No	All
Pennsylvania	Yes	1955	96	35,020	200,000	Yes	No	All
South Dakota	Yes	1943	50	50	100	Yes	No	P&A Only*
Tennessee	Yes	1968	50-60	3,179	3,179	No	Yes	P&A Only*
Texas	Yes	1919	60	113,000	113,000	Yes	No	All
Utah	Yes	1955	64	900	900	Yes	No	All
Virginia	Yes	1950	50	157	157	No	No	P&A Only*
West Virginia	Yes	1929	75	50,000	50,000	No	Yes	All
Wyoming	Yes	1951	67	15,000 <sup>b</sup>	30,000 <sup>p</sup>	Yes	No	P&A Only*
Totals				828,352	1,062,433			

<sup>a</sup> Pre-regulatory gas wells are now under North Dakota statutes and rules. <sup>b</sup> Estimate taken from 1996 survey. \* P&A = Plugged and Abandoned

## H. IDLE WELL STATISTICS

The primary purpose of the IOGCC idle well survey was to obtain a census of currently idle wells and their status by state. Other statistics were collected to provide an understanding of the current number and use of wells in each state and the number of wells that have been plugged and abandoned. Table V provides the following statistics drawn from the 2000 survey:

- ◆ Wells drilled since the state regulatory program began, by type (oil, gas, dry, service).
- ◆ Wells currently producing or injecting, by type (oil, gas, service).
- ◆ Wells that have been plugged and abandoned, by type (oil, gas, dry, service).
- ◆ Wells converted to Class II underground injection, both for enhanced oil recovery (EOR) and for produced water disposal.
- ◆ Wells currently idle with state approval (oil, gas, service).
- ◆ Estimated oil and gas production potential from wells idle with state approval (where available).
- ◆ Estimated number of wells currently idle without state approval, but where the operator is known.<sup>7</sup>
- ◆ Estimated number of wells currently idle without state approval, but where the operator is unknown or is insolvent (generally considered to be orphan wells).<sup>7</sup>

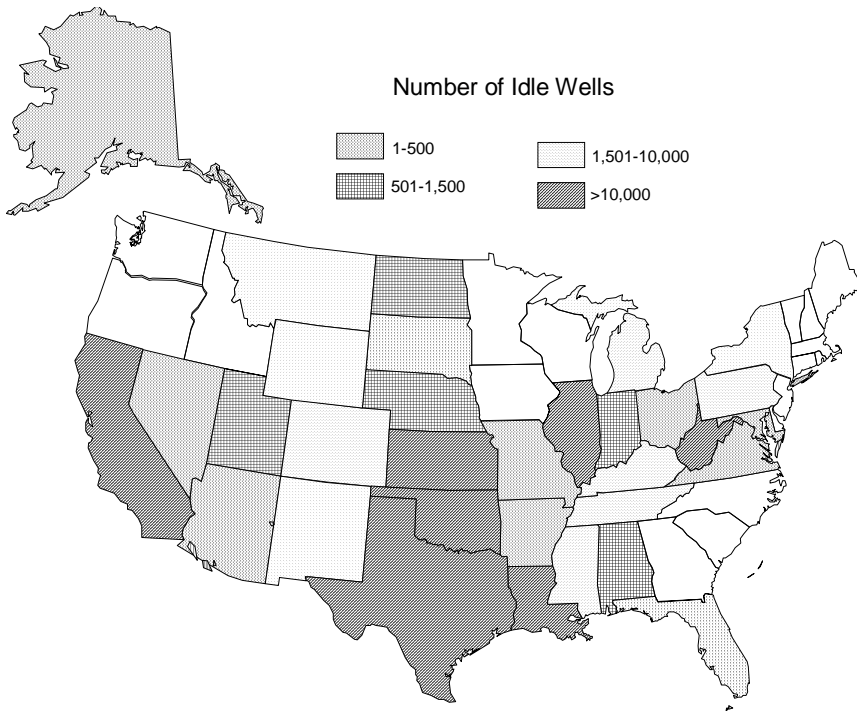
Because state data collection and management systems vary, the level of detail available from the states in these categories varies. Some states were able to extract well counts with substantial precision while, for others, the figures represent the best estimate based on available data and field experience. For some states, the total number of wells in a particular category was available, but numbers by well type were not available.

The data variations create several caveats for a reader examining Table V. Because of differences in definitions and the different start dates for state regulatory programs, state-to-state data in a category may not be directly comparable. Since not all states were able to provide breakdowns by well type, the total number of wells in a category (such as total wells drilled or wells plugged and abandoned) may be greater than the sum of oil, gas, dry, and service wells, which are provided only for those states that could provide a breakdown. The sum of wells currently producing/injecting and wells plugged and abandoned may not equal the figure for total wells drilled. This occurs due to a mix of pre- and post-regulatory program statistics for some states. For wells drilled, the survey requested only the number since regulation began. The number of producing/injecting wells may include wells drilled pre-regulation. States may also have abandonment records on pre-regulatory wells. Additional discussion of pre-regulatory wells, and estimates of their numbers, are included in Section III-G.

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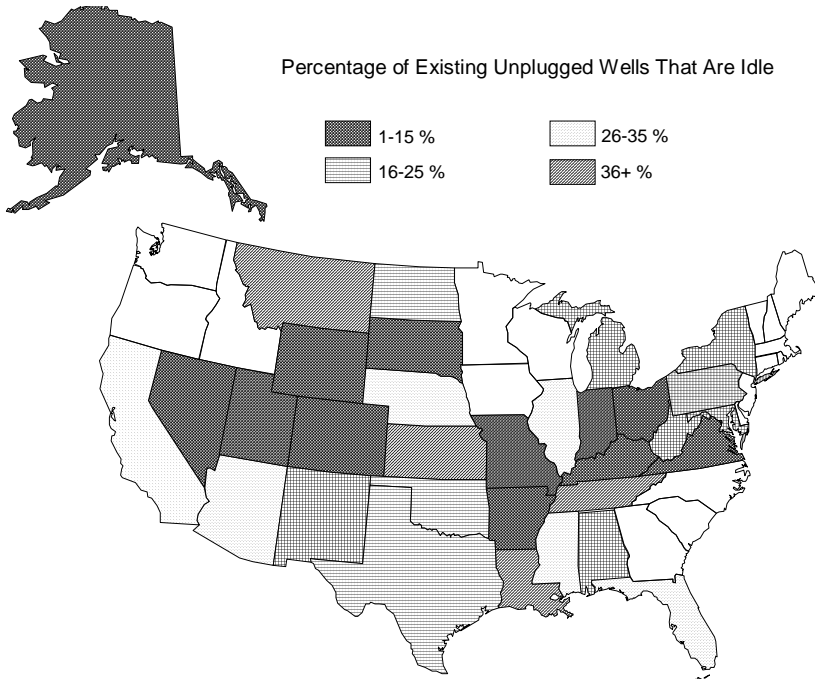
<sup>7</sup> Estimating the number of these wells is an imprecise science, since it is asking states to quantify the unknown. Numbers should be treated as best estimates by knowledgeable state personnel.

## Number of Idle Wells in Oil and Gas Producing States



Note: Numbers for Arkansas, Maryland, Tennessee, and Virginia are from the 1996 survey.

## Percentage of Existing Unplugged Wells that are Idle



Note: Existing unplugged wells are calculated by adding producing wells and all categories of idle wells.

Note: Numbers for Arkansas, Maryland, Tennessee, and Virginia are from the 1996 survey.

The map on the top of the preceding page illustrates the distribution of all three categories of idle wells by state: idle with state approval, idle without state approval but operator known, and orphan. Not surprisingly, some of the largest producing states and older producing areas have the largest number of idle wells. Texas has the largest number of idle wells – 115,557. Other states with more than 10,000 idle wells include: Kansas — as high as 59,956; Louisiana — 34,355; California — 29,129; Oklahoma — 25,978; and West Virginia — 12,512. These sound like large numbers, but it is important to place them in an appropriate context. First, a majority of these wells are idle with state approval. Most of the wells have some type of security, even when the operator has not complied with the state approval process. Secondly, with the exception of Virginia, these states have a large number of producing wells. Considering the idle wells as a percentage of the total existing wells in a state is more appropriate than absolute numbers for measuring the significance of idle wells. Thirdly, and most important, the total number of orphan wells reported has decreased since the 1996 survey.

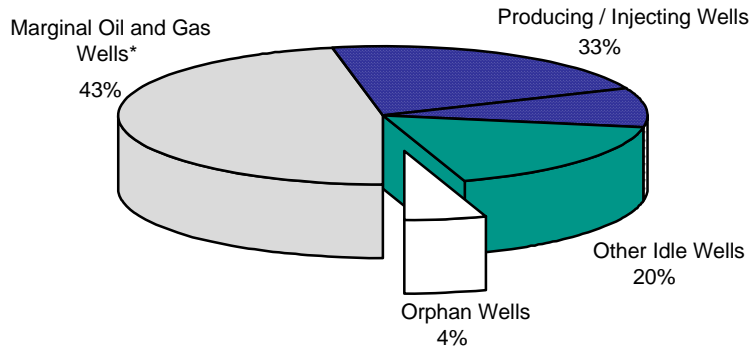
<b>Well Category</b>	<b>1992 Study</b>	<b>1996 Study</b>	<b>2000 Study</b>
Idle with state approval	147,000	150,689	167,263
Idle without state approval, operator known	18,000	70,472	118,703
Idle without state approval, operator unknown or insolvent (orphan wells)	50,000	63,438	57,064

The map at the bottom of the preceding page shows idle wells as a percentage of existing, unplugged wells (idle wells plus active production/injection wells), illustrating the relative importance of idle wells in each state. Nationwide, idle wells comprise around 24 percent of existing unplugged wells. Texas has the largest number of idle wells, 115,557. However, when these are considered as a percentage of existing wells, Texas is only slightly above the national average with 29 percent. States that have a smaller number of idle wells may actually have a much larger percentage of the wells in their state currently idle, such as Florida, and Nebraska, both with 35 percent. Also, it is important to remember that these numbers refer to all types of idle wells (many of which have surety), not just wells that are orphaned.

When contacted to estimate the amount of time a well had been idle, the states were asked to break down the wells into oil or gas. The states were further asked to estimate the percentage of total idle wells for each period of time. Of the states with access to this data, the majority responded that most idle oil and gas wells had been idle for at least 10 years. This figure is significant when considering whether a well will be able to be brought back into production. Of the states able to calculate this number, only New Mexico estimates that most of its idle wells have been so for less than one year.

As shown in this section, orphan wells represent only a very small portion of the total number of wells currently operating and idle. While these wells may represent a significant liability to the state, it is crucial to keep the size of the problem in appropriate perspective. Orphan wells represent only a small percentage of existing unplugged wells nationwide. Of those wells idle, only 17 percent are classified as orphan wells. While this percentage varies by state, only in Illinois and Pennsylvania does the number of orphan wells exceed 15 percent of the number of

**Orphan Wells are a Small Percentage of Existing Wells**



Data for Marginal Wells from: *Marginal Oil and Gas*, IOGCC, 1999.

existing wells. As described in Section III-B, states have tightened their financial responsibility requirements to help reduce future numbers of orphan wells. States also have developed funding mechanisms to allow them to plug and abandon orphaned wells (Section III-C).

Idle wells remain a small percentage of the number of existing wells. It must also be noted that orphaned wells, which represent a potential state liability, are a very small portion

of the total number of wells. Although many are marginal (stripper wells), the vast majority of existing wells continue to produce oil and gas, benefiting operators, states, and the nation.

Well statistics gathered for this section of the report are presented in Table V.





## Footnotes for Table V

Wells idle without state approval with an unknown or insolvent operator, are referred to as “orphan wells” in these footnotes.

1. Alabama did not break down the wells producing/injecting into categories. The figures for idle wells without state approval are from the 1996 survey.
2. Arkansas does not have a breakdown by category for the number of wells drilled or the wells producing/injecting. The figure for the number of plugged and abandoned wells is from the 1996 Arkansas survey. No current figures on the number of idle wells in the state of Arkansas were supplied for this survey. Arkansas does not break down well counts into oil, gas, and service well categories.
3. California did not break down the number of wells drilled, or wells plugged and abandoned into categories.
4. Colorado did not break down the wells producing/injecting into categories.
5. Florida did not break down the wells producing/injecting into categories. The state of Florida does not have an estimate for the number of illegally idle wells.
6. Illinois' total for the wells producing/injecting category includes all unplugged wells such as: temporarily abandoned wells, idle wells, and wells in the plugging program.
7. Indiana does not have the number of wells drilled or the wells producing/injecting broken down into categories. There is not a figure for the number of wells plugged and abandoned.
8. The Kansas figures for wells drilled and for the number of wells plugged and abandoned were not broken down into categories. Kansas was unable to provide a figure for the total number of wells converted to Class II injection wells. In recent years, conversions have occurred at a rate of 120 per year for EOR and 65 per year for disposal. The estimate for illegally idle wells, where the operator is known (estimated to be as high as 45,000), is based on an estimate of the level of compliance with the current temporary abandonment program.
9. Kentucky's figures for total wells drilled include 865 wells classified as oil and gas. The number of wells plugged and abandoned also contains 73 wells classified as oil and gas. That category also combines wells of an unknown type with those classified as service wells. Kentucky does not regulate UIC wells, but reported 1,950 EOR wells and 50 disposal wells in 1996. The category of wells illegally idle, where the operator is known, contains 16 wells classified as oil and gas. The category of wells illegally idle, where the operator is unknown, referred to as orphan wells, contains 40 wells classified as oil & gas.
10. The Louisiana figures for wells plugged and abandoned does not contain a figure for service wells. The state does not keep statistics on how many wells were converted to Class II wells, but their 1996 estimates were used for the purposes of this study. Louisiana does, however, keep a very detailed inventory of UIC wells. Idle wells are classified using well status codes (see appendix D).
11. Maryland did not supply a number of wells plugged and abandoned in their state. In 1996, they reported 162. Maryland does not break down well counts into oil, gas and service well categories. There were no estimates supplied for either of the illegally idle well categories. Maryland reported there were no legally idle wells at this time and had reported three wells legally idle in 1996.
12. Michigan does not have primacy over Class II UIC wells. The 1996 figures for the number of wells converted to Class II UIC wells were used for this survey. Michigan also included 100 wells classified as dry holes in its total number of legally idle wells. A breakdown into categories for the orphan wells was not available. Michigan states that some of the data comes from the years 1996–1998.



## Footnotes for Table V

13. Mississippi did not break down wells producing/injecting, or the numbers of wells legally idle, into categories. No estimate for the number of illegally idle wells, where the operator is known, was supplied.
14. Missouri did not break down the wells producing/injecting into categories. Their number of Class II UIC wells has not changed since the 1992 survey. The number of illegally idle wells in the state of Missouri is unknown.
15. Montana's figures for the number of wells drilled contains 2,336 wells that did not fit into one of the categories listed. Their numbers for wells producing/injecting were not broken down into categories. The number of wells plugged and abandoned also contains 2,050 wells that did not fit into one of the categories listed. Montana does not have an estimate for the number of wells illegally idle.
16. The number of plugged and abandoned wells and the number of wells legally idle in Nevada are approximated. Nevada does not have any gas wells in the state, and does not differentiate between oil wells, service wells, and dry holes for wells drilled and wells plugged and abandoned. No estimate of the number of wells illegally idle where the operator is known was available for this survey.
17. New Mexico did not supply a breakdown of which wells drilled were oil and which were gas wells. The number of wells producing/injecting, and wells plugged and abandoned in New Mexico were not broken down into categories.
18. The number of orphan wells in the state of New York is unknown.
19. North Dakota did not break down into categories the numbers for: wells plugged and abandoned; legally idle wells; or illegally idle wells, where the operator is known.
20. Ohio does not categorize oil and gas wells separately; therefore, there is no breakdown on numbers of oil and gas wells in the various categories. Most wells in Ohio produce both oil and gas. The number of wells legally idle was unknown, but was reported as 49 in 1996.
21. Oklahoma estimates that an additional 50,000 wells were drilled before regulation began in 1915. The number reported for Class II UIC wells is an estimate. Oklahoma estimates that 90 percent of all UIC wells were converted, but no actual number is available. It should be noted that in 1996 Oklahoma did not supply a figure for illegally idle wells, where the operator was known. The Corporation Commission did not maintain annual well plugging activity statistics until January 1, 1971, but has hard copy records of the wells plugged since that date. The Corporation Commission believes that the remaining non-active wells were properly plugged under the governing rules and standards in effect at the time. Oklahoma classifies known idle wells as producing wells.
22. Pennsylvania did not break down the wells producing/injecting into categories. The number of legally idle wells in Pennsylvania is currently unknown, but the 1992 survey reported 13,426. Pennsylvania does not have an estimate for the number of illegally idle wells, where the operator is known.
23. South Dakota did not break down the wells producing/injecting into categories.
24. The Tennessee figures for the number of wells drilled contain 2,063 wells referred to as unclassified. The figures for wells producing/injecting, and for wells plugged and abandoned were not broken down into categories. Tennessee did not supply any data on the number of either legal or illegal idle wells in their state.
25. Texas states that individual well records are not available prior to 1939. However, based on the Commission's GIS database, approximately 1,049,600 locations have been identified. Legally idle service wells are included in the oil and gas categories. The figure of 16,000 orphan wells (unknown operators) is a RRC estimate.
26. Historical records since commencement of regulation in Utah do not allow a characterization of the number of oil wells and gas wells which have been both drilled

## Footnotes for Table V

- and/or plugged. The Division's database only shows the well type of oil or gas for wells, which are currently capable of production. In Utah, the categories are: producing oil wells, shut-in oil wells, producing gas wells, shut-in gas wells, gas injection wells, gas storage wells, water disposal wells, water source wells, water injection wells, temporarily abandoned wells, and plugged and abandoned wells.
27. The number of wells drilled, wells producing/injecting, and the number of wells plugged and abandoned in Virginia were not placed into categories. Virginia reports that no state permit or approval is required for wells to be idle, but reported 241 wells idle in 1996.
  28. West Virginia's numbers for wells drilled, wells producing/injecting, wells plugged and abandoned, legally idle wells, or illegally idle wells were not broken down into categories.
  29. Wyoming did not provide an oil and gas well breakdown for: wells producing/injecting, wells legally idle, or for idle wells, where the operator is unknown. There is no estimate of the number of wells illegally idle, where the operator is known.
  30. For a number of states, totaling the reported numbers of wells producing/injecting, plugged and abandoned, and idle yields a number greater than the number of wells drilled since the inception of regulation. Except where noted, this generally results from the inclusion of pre-regulatory wells in the numbers of producing/injecting, plugged and abandoned, and/or idle wells.

## **I. ENERGY AND ENVIRONMENTAL CONCERNS**

Oil and gas producing states address idle wells as a factor in the balance of resource conservation, state revenue and potential liability, and environmental protection. This is reflected in the IOGCC mission to promote conservation and efficient recovery of domestic petroleum resources while protecting health, safety, and the environment.

Conservation statutes exist in producing states to ensure that oil and gas resources are developed in a manner that will prevent waste, which means they are not depleted prematurely through overproduction and depletion of reservoir pressure. Although currently idle, wells may still be capable of production or of use in an enhanced recovery project. Moreover, these wells may provide access to substantial volumes of oil and gas remaining in the reservoir that may not be recoverable under current technology or economic conditions, but that could become recoverable in the future. The premature abandonment of such wells would eliminate access to these resources.

States benefit substantially from oil and gas development through tax revenues, employment earnings, and other economic activity. Many states fund oil and gas conservation programs with percentages of severance or other taxes, or supplement such programs through fees for permits or other services provided by the regulatory agency. The decline in industry activity since the mid-1980s has severely affected funding for many states. In 1998, the greatly depressed economic conditions in the oil fields served to emphasize the need for idle well evaluation. The future development of oil and gas resources associated with wells currently idle could provide potential revenues. Furthermore, states have a strong incentive to avoid inheriting operator responsibility for plugging and abandoning wells that are no longer capable of producing.

State agencies are interested in protecting the environment, and the states consider the potential for contamination of ground water or soils from idle wells. State plugging funds are geared toward the remediation of orphan wells and/or sites posing the greatest environmental risk. Regardless of well status or if funds from securities or financial assurance programs are available, most states have avenues to address and remediate wells that pose an imminent hazard to public safety, health, and the environment.

The IOGCC survey asked questions gauging state experience in these areas. Specifically, the survey requested information on the resource potential associated with wells that are currently idle and on any proven or suspected environmental damage resulting from idle wells. The following discussion focuses on the energy, economic potential, and environmental concerns associated with idle wells.

### **Energy and Economic Potential**

This report identifies numerous oil and gas wells that are idle (see Section III–H), and many of these wells may be capable of returning to production or contributing to enhanced production through their use as an injection well. This section of the report addresses the production potential and economic value that idle wells could represent to states. Several states have enacted incentives to bring idle wells back into production, with positive economic benefits. These incentives are discussed in Section IV of this report.

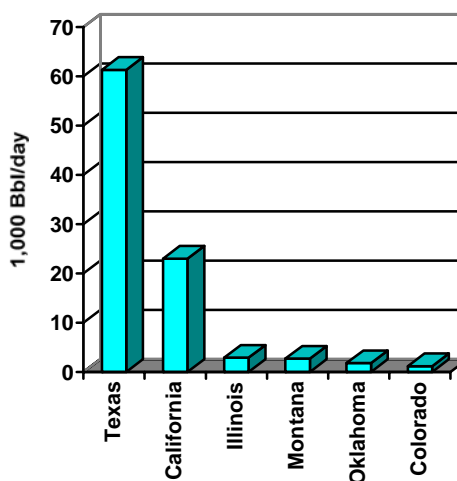
When providing the number of idle wells, states were asked to estimate the potential production associated with these wells. While a few states were able to do so, most were not. Therefore, a consistent, simplistic approach has been used to estimate the potential future production across all states. It was felt that using the average production volume from stripper wells in the state would overstate the production potential, since wells capable of that level of production would probably not be idle. Therefore, one barrel per day (bbl/d) or 10 thousand cubic feet per day (Mcf/d) have been used as estimates of the potential of these wells. It should be noted, however, that in some states, the volume of production required to make a well profitable to produce is higher than one barrel or 10 Mcf per day, while in other states the required production volume may be lower.

Assuming that the average idle oil well in the U.S. is capable of producing one bbl/d, the oil production potential represented by wells currently with state approval to be idle is more than 94,000 bbl/d. This could represent an increase of much more than one percent in domestic oil production. Likewise, assuming that the average idle gas well is capable of producing 10 Mcf/d, the production potential represented by gas wells idle with state approval is nearly 177,000 Mcf/d, a small percentage nationwide, but one potentially significant in some states. If returned to production, the harvest from these idle oil and gas wells could generate additional severance taxes for the states, revenue for producers, and jobs and benefits for the economy.

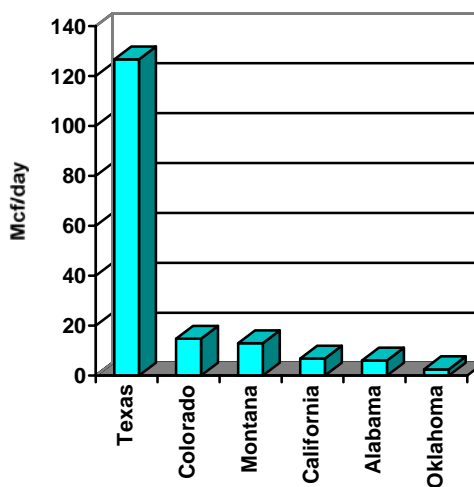
These estimates assume that all state approved idle oil and gas wells are placed back into production. Some of the wells listed as idle might be slated for conversion to injection wells for enhanced recovery or water disposal purposes, or may be incapable of production due to technical, economic, or lease-management constraints. Thus, some of the estimates developed in this analysis could be overstated. On the other hand, wells converted to injection would still be contributing to increased production. This increase in using enhanced oil-and gas-recovery processes may offset any loss in producing wells, making the above estimates reasonable.

Several states have enacted incentives for returning idle wells to production (see Section IV). These have been successful in creating economic benefits for the state. Texas has enacted the Two-Year Inactive Well Incentive Program (Texas Tax Code, § 202.056 adopted by the 75<sup>th</sup> Legislature, 1997, and extended by the

**States with Largest Oil Production Potential from Idle Wells**



**States with Largest Gas Production Potential from Idle Wells**



76<sup>th</sup> Legislature, 1999): This is comparable to the Three-Year Inactive Well Incentive that was introduced in 1993. Under the new incentive, if an oil or gas well has been inactive (i.e., has no more than one month of production) during the preceding two years, any new oil, gas well gas, or casing head gas production may be eligible for up to a 10-year severance tax exemption. Certification began September 1, 1997, and ends February 28, 2010.

Louisiana also offers severance tax breaks for idle wells placed back in service, along with breaks for stripper wells. Wells that are inactive for more than two years or have been in production less than 30 days in two years, are covered by the Inactive Well Incentive Program, called Act II, (LSA-R.S. 47:648.1-648.4 amended) and can be exempt from severance taxes for five years. The estimated number of wells in this incentive program is 1,950.

Plugging of idle wells could result in premature abandonment of remaining oil and gas resources. Regaining access to an abandoned reservoir with new wells may be an expensive undertaking that could seriously undermine the economic viability of future enhanced recovery projects. Studies have shown that if wells must be redrilled, potential oil reserves may be reduced by up to one-third.<sup>8</sup>

The oil-resource potential associated with currently idle wells could be significant. [Data for gas wells are not available.] The U.S. Department of Energy has estimated that if oil prices remain near \$20 per barrel, wells currently idle with state approval could provide as much as 3.2 billion barrels of oil using conventional recovery techniques, and an additional 620 million barrels of potential reserves through enhanced recovery techniques.<sup>9</sup> A simplistic methodology was utilized by DOE to develop upper-bound estimates of future resource recovery potential from idle wells. Given the assumptions inherent in this methodology, these estimates of potential remaining reserves are optimistic. Obviously, higher oil and gas prices would make bringing many idle wells back into production more economically feasible.

## **Environmental Concerns**

The states have a long and distinguished history of protecting the environment while ensuring appropriate development of energy resources. The first statute establishing well plugging techniques to protect ground water was enacted in New York in 1895. Protection of ground water pre-dates formal regulatory programs in numerous states.

The potential for ground water contamination is the primary environmental concern associated with idle wells. An open (unplugged) wellbore could potentially serve as a conduit for the migration of reservoir fluids into a ground water aquifer. It is also conceivable that water from a highly saline aquifer could migrate to a current or potential source of drinking water. In some cases, fluids could flow all the way to the surface, potentially contaminating surface soils surrounding the well.

Given these environmental concerns, the IOGCC survey asked states whether they had evidence of ground water contamination by idle wells (those falling under the state's idle well program) or by improperly plugged and abandoned wells. In general, the states conclude that

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<sup>8</sup> Brashear, J.P., Biglarbigi, K., Becker, A.B., and Ray, R.M., "Effect of Well Abandonments on EOR Potential", *Journal of Petroleum Technology*, December 1991.

<sup>9</sup> These numbers are from the 1996 study.

idle wells, regulated under existing state programs, pose minimal environmental risk. The current protections built into state requirements, including methods for temporarily abandoning or idling a well and testing mechanical integrity, further minimize these risks. Should unforeseen problems arise, state authority allows these problems to be addressed promptly to protect the environment. IOGCC survey responses show that improperly plugged and abandoned wells (typically very old wells abandoned before state plugging regulations were implemented) have been the source of some soil and ground water contamination in a few states. States have established orphan well programs and state plugging funds to promptly address these wells and clean up any contamination that may occur (see Section III-C). Furthermore, many states actively seek to identify and remediate the wells before any contamination can occur.

The environmental risk posed by these wells is *variable*, based on wellbore and subsurface conditions. Mechanical barriers within the well (elements of the well's construction) are a key factor in preventing fluid migration. Another risk factor to be considered is the presence of pressurized formations that could encourage fluid migration. Several other factors could also inhibit fluid flow within the well, although these factors may be somewhat difficult to assess: borehole restrictions such as drilling mud, sloughing shales, and collapsed formations; relatively long vertical distances between fresh water aquifers and pressurized formations; and the presence of extremely porous and permeable intervening formations. Under current underground injection control (UIC) requirements, when a new well is placed on injection status, all wells (active, idle, abandoned) within its area of review (typically a ¼-mile radius) must be studied to determine whether they pose a risk of contamination. This information, where available, further allows states to assess the level of risk posed by idle wells.

The oil and gas industry also has been proactive in identifying the potential risks posed by idle wells and advocating appropriate management practices. In 1993, the American Petroleum Institute (API) issued environmental guidelines on well abandonment and inactive well practices.<sup>10</sup> API recommends that operators characterize the potential risks posed by an idle well based on wellbore construction and the existence of pressured formations that would encourage fluid migration. Once the risks are characterized, API suggests appropriate monitoring procedures for several different levels of risk, with greater frequency of monitoring for those wells that pose the greatest risk. For wells with significant levels of risk, API suggests immediate site investigation and potential plugging of the wellbore to protect the environment. The API guidelines are consistent with the approaches inherent in most state programs, reflecting the strong commitment by both industry and the states to ensure that wells can remain idle safely until they can again be reused to recover oil and gas resources. In addition, the API guidance document also specifies proper plugging and abandonment procedures to help operators ensure that wells with no production potential pose no future environmental risks. As mentioned in Section III-D, this 1993 API document remains the controlling authority in 2000.

The IOGCC has been proactive in assisting states to effectively regulate the management of wastes from oil and gas operations. In 1994, the IOGCC issued environmental guidelines for state oil and gas regulatory programs<sup>11</sup> that include guidance on identifying, remediating, and funding the remediation of orphaned (abandoned) oil and gas sites. These guidelines include

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<sup>10</sup> American Petroleum Institute, *Environmental Guidance Document: Well Abandonment and Inactive Well Practices for U.S. Exploration and Production Operations*, API Bulletin E3, January 31, 1993.

<sup>11</sup> Interstate Oil and Gas Compact Commission, *IOGCC Environmental Guidelines for State Oil and Gas Regulatory Programs*, May 1994.

criteria for prioritizing abandoned sites for state action, such as: 1) the occurrence or potential for an imminent release from the site; 2) the nature, extent, and degree of contamination; 3) the proximity of the site to populated areas, surface water, and/or ground water; 4) whether the site is in an environmentally sensitive area; 5) wellbore lithology and condition. For information on some of the criteria currently used by states in setting plugging and remediation priorities for state funds, see Section III-C and Appendix B of this report.

Regardless of well age or status, the states have avenues to remediate or prevent contamination from any wells (active, idle, orphaned, or abandoned). States actively seek to prevent problems by focusing on high-risk wells, and promptly addressing any problems that occur. They protect the environment while enabling responsible development and production of the nation's oil and gas resources

## IV. INNOVATIVE PROGRAMS, INCENTIVES, AND NEW LEGISLATION

State agencies often seek authority for actions that will help them to better meet their objectives of appropriate development of the state's energy resources and protection of the environment. In recent years, this has sometimes meant expanding authority to address idle or orphaned wells. States also have adopted innovative programs that encourage idle wells to be placed back into production or to be cleaned up and the well sites restored. This section summarizes recent actions in state legislatures and other state programs related to idle and orphan wells. For more information on the innovative programs described below, contact the state representatives listed in Appendix E.

### Expanded Authority or Funding

Many states have expanded the authority of their regulatory agencies. Several states have also sought to support their well plugging efforts through increased funds. These increases often have been obtained through the imposition of fees on the oil and gas industry. In 1998, Kansas altered its security requirements for operators. Nebraska created a plugging fund in 1999. Along with these two, some of the other important changes among the states are noted below.

**Alabama** On March 5, 1999, Alabama adopted Rule 400-4-5-.04, entitled Protection of Drinking Water Sources During Hydraulic Fracturing of a Coalbed Methane Gas Well. On August 20, 1999, the Legislature revised Rule 400-4-5-.04 to include: a new title, Protection of Underground Sources of Drinking Water During Hydraulic Fracturing of Coal Beds; additional compliance standards; and adoption of an amendment to Rule 400-4-1-.02, Definitions, so as to include Underground Source of Drinking Water.

**California** In 1996, legislation was passed allowing operators to "take an orphan well for a test drive" (discussed in this section under Innovative Programs). Under the same legislation, California provided a financial incentive by waiving the oil and gas assessment for five-year idle wells returned to production after January 1, 1997.

California changed its bonding statutes on January 1, 1999. For individual well bonds, each amount was increased by \$5,000. Bond amounts are based upon depths and come in three increments as follows: wells less than 5,000 feet - \$15,000; wells 5,000 to 10,000 feet - \$20,000; wells deeper than 10,000 feet - \$30,000. Blanket bonds are as follows: \$1 million "super" blanket bond covers all wells, including idle wells; \$250,000 covers more than 50 wells, but not idle wells; \$100,000 covers 50 or fewer

### Innovative Programs

- Enlisting landowner assistance in plugging
- Allowing well plugging as community service in lieu of fines
- Industry education and site restoration funded through levy on production
- Saving wells scheduled for abandonment for research and future use



wells, but not Idle wells.

A new idle well program went into effect on January 1, 1999. For each idle well not covered by an individual well bond or a “super “ blanket bond, the operator must do one of the following:

- ◆ Pay a fee based on how long the well was idle (\$100 if idle for five years, \$250 if idle for 10 years, or \$500 if idle for 15 or more years).
- ◆ Post a \$5,000 idle well bond.
- ◆ File an escrow account agreeing to deposit \$500 per year into the account for 10 years.
- ◆ File an Idle Well Management Plan agreeing to reactivate or plug certain idle wells over the next 10-year period.

In addition to the above bonding changes, the plugging fund was increased from \$500,000 annually to \$1 million annually for five years, after which time it reverts back to \$500,000 annually.

### ***Illinois***

In Illinois, legislation was adopted in 1997 streamlining the Department's authority to take control of and sell salvage equipment to offset plugging costs. The state also has been working with the EPA since 1995 to use Oil Pollution Act funds to plug and clean up abandoned production facilities.

### ***Indiana***

In 1999, a new rule was promulgated which provided for alternate tests for verifying the integrity of temporarily abandoned wells. This rule also allowed the Indiana Division of Oil & Gas to consider geologic, engineering and economic factors in granting a second term of temporary abandonment.

### ***Kansas***

Financial responsibility requirements for oil and gas operators in Kansas became effective January 1, 1998. Operators must demonstrate compliance with one of the following:

- 1) Provide bond or letter of credit totaling \$0.75/foot of well depth of all wells operated in the state.
- 2) Provide blanket performance bond or letter of credit based on number of wells and well depth:
  - For wells < 2,000 ft: 1–5 = \$5,000; 6–25 = \$10,000; >25 = \$20,000
  - For wells > 2,000 ft: 1–5 = \$10,000; 6–25 = \$20,000; >25 = \$30,000
- 3) Have an acceptable compliance record over the past 36 months, no outstanding undisputed orders or unpaid fines and no officer or director who is associated with another company having outstanding orders or fines, and pay a \$50/year nonrefundable fee.
- 4) Pay nonrefundable annual fee equal to 3 percent of otherwise required bond amount.

- 5) Give state first lien on tangible property that has a salvage value equal to or greater than required bond amount.
- 6) Provide other financial assurance approved by the Commission.

This legislation also provides \$1.6 million annually for plugging orphan wells and remediating contaminated sites. Funding for this program is a mix of industry assessments, state funds, and federal mineral royalties.

<b>Michigan</b>	On September 20, 1996, Michigan changed its bond amounts to \$10,000 to \$30,000 for an individual well, and \$100,000 to \$250,000 blanket bond for multiple wells. The \$250,000 bond is for unlimited wells.
<b>Mississippi</b>	As of July 1, 1998, the state of Mississippi began allowing different types of security to insure proper plugging of abandoned wells. (see details in Table I).
<b>Montana</b>	In 1998, Montana raised its blanket bond amount to \$50,000.
<b>Nebraska</b>	On August 28, 1999, the Nebraska legislature passed LB 293, Statute 57-923. By this action Nebraska established a plugging fund. The target amount of the fund is yet to be determined.
<b>Ohio</b>	In 1999, under Senate Bill 187, Ohio modified the types of security accepted to insure proper plugging of wells. Ohio now accepts a financial statement covering a \$10,000 single well bond and a blanket bond of \$30,000.
<b>Oklahoma</b>	Title 17 O.S., § 53 prohibits the Oklahoma Corporation Commission from ordering idle wells plugged when the posted price of Oklahoma Sweet Crude oil falls to less than \$15 per barrel, unless such well “poses an imminent threat to the public health and safety...”
<b>Pennsylvania</b>	In 1997, Pennsylvania modified the type of security accepted by their state to insure proper plugging of wells by exempting pre-regulatory wells.
<b>Texas</b>	The Railroad Commission has proposed a rule requiring that financial assurance be in place for a well entering its third year of inactivity. The rule would also require financial assurance for low producing wells being transferred between operators. Annual fluid level testing would be required to show if a well is environmentally sound.

### **Tax Incentives**

In 1994, the National Petroleum Council (NPC) completed a report assessing the costs and benefits of various incentives, particularly tax incentives, for maintaining production from marginal and stripper wells.<sup>12</sup> State regulators worked with industry in the preparation of this

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<sup>12</sup> National Petroleum Council, *Marginal Wells*, July 1994.

report. This NPC report recommended four federal tax incentives that could encourage continued production from marginal wells. The NPC also recommended regulatory and royalty relief and state tax incentives as key elements in improving marginal well economics. However, not all states can avail themselves of this approach; some states do not impose severance taxes.

In keeping with the NPC recommendations, several states have enacted tax incentive measures directed toward marginally producing wells. The most common measure is a reduction in the amount of severance tax required. Since the 1996 study, many of the states have enacted tax incentives to prolong production from marginal wells, capture the economic benefits of this continued production, and prevent marginal wells from becoming idle for economic reasons. Twelve states (Arkansas, Kansas, Kentucky, Louisiana, Michigan, Mississippi, Montana, New Mexico, North Dakota, Oklahoma, Texas and Wyoming) have established specific severance tax reductions for placing idle wells back into production. This is an increase of four since the 1996 study. Many states offer tax abatement other than from the severance tax. The tax incentives warranting discussion are summarized below. Current tax and other incentives related to marginal and idle wells in oil and gas producing states, including incentives under consideration, are summarized in Table VI at the end of this section.

- Alabama** The severance tax for oil and gas permitted on or after July 1, 1996, and before July 1, 2002, is reduced 50 percent for a period of five years.
- Arizona** Arizona reduced the property tax assessment ratio for producing wells to 25 percent from 100 percent of full cash value.
- Arkansas** Act 1093 was passed in 1995 to provide severance tax relief to certain projects designed to increase oil production in the state:
- ◆ 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.
  - ◆ An inactive oilfield that is later returned to production is exempt from severance taxes for oil produced from all zones, horizons, and formations that once were productive but have ceased to produce.
  - ◆ Enhanced oil recovery projects approved by the Oil and Gas Commission are entitled to a 50 percent reduction in severance taxes for the incremental volume of oil attributable to the project.
  - ◆ Increased (incremental) production due to application of new research technologies approved by the Oil and Gas Commission is exempt from severance tax.
- Florida** The severance tax for small well oil and tertiary oil was reduced from 8 percent to 5 percent for wells producing less than 100 barrels of oil per day. Onshore production is not subject to any tax if: (1) production used for lease operations where it is produced; (2) gas returned to horizon(s) in field where produced; (3) gas vented or flared; (4) production from new field wells, completed after July 1, 1997, for 60 months after completion; (5) production after July 1, 1997, for a period of 48 months after completion, date from: (a) any new producing well in existing field that was established by Florida Department of Environmental Protection before July 1, 1997; (b) a well out of service for 24 months prior July 1, 1997, and returned to production through workover; (c) a temporarily abandoned well for 24 months, prior to

July 1, 1997, brought into production through a redrill or recompletion; (6) Production after July 1, 1997, for 60 months after completion date from any horizontal well or any well with a total measured depth of 15,000 feet; and (7) no exemptions for (4), (5), and (6) after June 30, 2002.

**Kansas**

SB714, "Three Year Inactive Wells," was passed by the Kansas Legislature in 1994. It allows a 10-year exemption from severance tax for inactive wells returned to production. To qualify, a well must have been inactive prior to July 1, 1993, and must have produced for no more than one of the 36 months prior to filing with the Commission for approval. This bill applied only to wells placed back on production prior to July 1, 1996.

House Bill 2419 was enacted by the Kansas Legislature in 1998. It provides for a 50 percent tax credit to the taxpayer for expenditures made in plugging abandoned and orphaned wells located on land owned by the taxpayer. Wells plugged under this program must have been drilled prior to January 1, 1970. The bill also places a cap of \$250,000 in total credits per year for the entire program. Filings and granting of the credit are on a "first come" basis.

**Kentucky**

Kentucky's "Two Year Inactive Wells" incentive gives producers a 100 percent credit on the 4.5 percent severance tax for oil and gas wells that are brought back into production after having been inactive for two years or plugged and abandoned. This initiative allows producers with a proper testing permit to test inactive wells for 60 days prior to posting bond for the well. The goal is to bring inactive or abandoned wells back into production.

**Louisiana**

ACT II (LSA-R.S. 47:648.1 - 648.4 amended) states that wells which have been inactive for more than two years, or have less than 30 days production in two years, fall under the "Inactive Well Incentive Program." These wells can be exempt from severance tax for five years. There are an estimated 1,950 wells in this program.

**Michigan**

Michigan has previously enacted a severance tax reduction from 6.6 percent to 4 percent for oil wells classified as marginal or stripper (wells producing less than 5 barrels of oil per day). For certain Antrim Formation gas wells, the severance tax was reduced from 5 percent to 4 percent.

State Statute 27-25-503 allows that wells reactivated after two years are exempt from severance taxes for three years. This exemption ends July 1, 2003, or when oil exceeds \$20 per barrel. Also, wells producing less than 20 bbl/day from less than 7,500 feet and wells producing less than 40 bbl/day from deeper than 7,500 feet receive a 2/3 reduction in the severance tax as long as the average sale price is less than \$12 per barrel.

**Montana**

Montana offers tax breaks and reductions for stripper wells.

**New Mexico**

In 1995 and 1999, New Mexico passed legislation to reduce the 3.75 percent severance tax on several categories of wells.

- ◆ NMSA 1978 § 7-29B-2 provides for a production restoration tax incentive. Reduced tax rate for wells idle for 24 months brought back

into production.

- ◆ NMSA 1978 § 7-29B-2; also provides a well workover tax incentive. Reduced tax rate for production from workover wells if the well has an increase in production.
- ◆ NMSA 1978 § 7 -29B-2; provides for a stripper well tax incentive. Reduced tax rate for wells producing less than 10 BOPD / 60 MCFD. This Act also reduces the emergency school tax rates from 4 percent to 2 percent or 3 percent for gas and from 3.15 percent to 1.58 percent or 2.36 percent for oil during periods of low prices.

**North Dakota**

North Dakota has a stripper well tax exemption. Stripper wells can be exempted from 6.5 percent extraction tax.

**Oklahoma**

Oklahoma provides for many forms of tax incentives. Title 68 O.S., Article 10, § 1001.1 provides for relief from the state's gross production tax for differing types of operations:

- ◆ Deleterious substances.
- ◆ Enhanced recovery projects — Receive an exemption from the gross production tax as follows:
  1. Secondary enhanced recovery projects beginning after July 1, 1993, and before July 1, 2000 — allowed enhanced recovery project costs shall include only incremental capital costs and 50% of incremental operating expenses, provided however that the period for project payback shall not exceed a period of 10 years from the project beginning date.
  2. Tertiary enhanced recovery projects beginning after July 1, 1993, and before July 1, 2000 — allowable enhanced recovery project costs shall include only incremental capital costs and incremental operating expenses excluding administrative expenses. The capital expenses of pipelines constructed to transport carbon dioxide to a tertiary recovery project shall be included in determining project payback. The period for project payback shall not exceed 10 years from the project beginning date.
- ◆ Inactive wells placed back into production after two years or more of inactivity — exempt from the 7 percent gross production tax for 28 months from the date the well was placed back into service.
- ◆ Deep wells — Receive an exemption from the levy of the 7 percent gross production tax on the production of gas, oil or gas and oil from deep wells.
- ◆ New discovery wells — Receive an exemption from the levy of gross production tax on wells spudded or reentered between July 1, 1995 and June 30, 2000.
- ◆ Horizontally drilled producing wells — Receive an exemption from the levy of gross production tax.

**Texas**

The “Three-Year Inactive Well Incentive” (Texas Tax Code, § 202.056

adopted by the 73<sup>rd</sup> Legislature in 1993): Beginning September 1, 1993, through February 29, 1996, the Commission designated wellbores with no more than one month production in the preceding three years as candidates for the three-year inactive wellbore incentive. If a designated wellbore was brought back to production, the crude oil, gas well gas, and casing head gas produced was eligible for a severance tax exemption for up to 10 years or until January 31, 2006. Wells designated under the three-year program, but not brought back to production before the February 1996 deadline were re-designated under the Two-Year Inactive Well Incentive Program. If ownership of the well is transferred, the new operator may transfer the exemption for the remainder of the 10 years.

The “Two-Year Inactive Well Incentive (Texas Tax Code, § 202.056 adopted by the 75<sup>th</sup> Legislature in 1997, and extended by the 76<sup>th</sup> Legislature in 1999): This is comparable to the “Three-Year Inactive Well Incentive that was introduced in 1993. Under the new incentive, if a well is inactive (i.e., has no more than one month of production) during the preceding two years, any new oil, gas well gas, or casinghead gas production may be eligible for up to a 10-year severance tax exemption. Certification began September 1, 1997, and ends February 28, 2010.

In 1995, the Texas Natural Resources Code, Title 3, Oil and Gas, Subtitle B, Conservation and Regulation of Oil and Gas, Chapter 93 was adopted to initiate the Texas Experimental Research and Recovery Activity (TERRA) Program. This program became effective on January 1, 1996, and it was implemented to keep non-polluting, mechanically sound wellbores from being plugged. However, the industry did not universally accept this program and the Commission did not budget the program in FY 2000.

In 1989, Texas passed an incentive for enhanced oil recovery (EOR) projects that allows a 50 percent reduction of the state’s 4.6 percent oil severance tax rate for all oil production from new EOR projects and incremental production from expanded EOR projects. Currently idle wells may be used on these new EOR projects. There is a two-step approval process to receive the severance tax credit. The first step requires oil and gas operators to seek approval of the project prior to active operation of the project. The second step requires certification, within a specific time frame, that there has been a positive production response to the technique being used. The reduced severance tax applies for 10 years following the certification of positive response. The deadline for applying for initial project approval and area designation is January 1, 2008.

The “Incremental Production Incentive” (Texas Tax Code, § 202.057 adopted by the 75<sup>th</sup> Legislature in 1997): Leases with wells that averaged seven BOE a day or less in 1996 are eligible for a 50 percent tax reduction on incremental production. The period from September 1, 1997, through December 31, 1998, is used to determine any increase in production over the 1996 baseline level. Primary, secondary, or tertiary techniques may be used to increase production; the primary production technique must involve an expenditure of at least \$5,000. The exemption is granted as long as the

price of oil, as judged by the Comptroller, remains below \$25. It is suspended if the price reaches \$25 or more for three consecutive months and reinstated when it is below \$25 for three consecutive months. Certification for this incentive program has ended.

In 1999, the 76<sup>th</sup> Texas Legislature passed SB290 (Texas Tax Code, § 201.059 and 202.060). This emergency legislation provided short-term severance tax relief to producers of marginal oil and gas wells when oil and gas prices fell below certain low levels. If wells qualified and the State Comptroller certified low prices, crude oil, gas well gas, and/or casing head gas produced between February 1, 1999, and July 31, 1999, was exempt from severance taxes.

**Utah** Utah has passed a severance tax exemption for stripper wells; a severance tax credit on a portion of expenses used for workover and recompletion activities; and a severance tax credit for 50 percent of the value of incremental recovery for state approved enhanced recovery projects.

**West Virginia** WV Code 11-13A grants severance tax relief for certain previously abandoned wells, marginal wells, and on free gas provided to surface owners.

**Wyoming** W.S. § 39-14-204 (a) (iii) grants severance relief to stripper production. W.S. § 39-14-204 (a) (ii), (iii), and (iv) grants severance tax relief to crude oil extracted from collection wells prior to January 1, 1999. W.S. § 39-14-204 (a) (iii) grants a five-year severance tax exemption to tertiary production. Crude oil or natural gas from certain wildcat wells was granted a four-year period of relief from the severance taxes imposed by W.S. § 39-14-204 (a) (iii) and (iv). Crude oil and natural gas produced from wells drilled between July 1, 1993, and March 31, 2003, except the production from collection wells, is exempt from the severance tax. Incremental crude oil or natural gas production resulting from a workover or re-completion or an oil or gas well between January 1, 1997, and March 31, 2001, is exempt from the severance taxes for a period of 24 months. Crude oil produced from previously shut-in wells is exempt from the severance taxes for the first 60 months of renewed production or until the average price received by the producer for the renewed production is equal to or exceeds \$25 per barrel of oil for the preceding six months, whichever occurs sooner. Natural gas which is vented, flared, or reinjected is exempt from taxation.

### **Innovative Programs**

Several states have established innovative programs designed to keep marginal wells producing. They include mechanisms to familiarize producers with new technologies that may enhance production. These mechanisms are designed to reduce the potential that these wells will become idle or orphaned. Other states have developed innovative ways of encouraging orphan wells to be plugged. Still others are attempting to find productive use for orphan wells and are exploring alternatives to plugging.

- Alaska** The “Cook Inlet Royalty Reduction” states that firms shall pay a royalty of 5 percent on the first 25 million barrels of oil and the first 35 billion cubic feet of natural gas produced for sale from that field that occurs 10 years following production. Production must begin prior to January 1, 2004. The effective date is August 8, 1998. The end date is 10 years after production begins. The goal is to initiate production from undeveloped or shut-in oil and gas fields in the Cook Inlet.
- Arkansas** Act 1093 - 1995 provides an economic incentive for the continued production of oil wells that have reached their economic limits; to encourage efforts to re-establish production from inactive wells; to encourage the initiation of enhanced oil recovery methods in order to maximize the production of crude oil; and for other purposes.
- California** SB 2007 (Costa) went into effect on January 1, 1998. This allows an operator to adopt an orphan well and test the well for up to 90 days without incurring liability for the plugging of the well. The purpose of the “take an orphan well for a test drive” program is to get wells back into production and off the plugging list. This innovative program also provides that for any well idle for five years put back into production, the oil and gas produced from that reactivated well will not be subject to assessment for 10 years.
- Illinois** In 1997, a Landowner Grant Program was adopted to provide grants to landowners to plug abandoned wells on their property. The grant program allows efficient distribution of funds to plug wells without involving complex administration competitive bidding procedures. Illinois reports this program has been very successful.
- Indiana** The state is working with oil and gas operators and industry associations to develop a voluntary plugging program where operators would donate time and the state would pay for materials. This project is in the development stage, and no wells have yet been plugged under this program.
- Missouri** In lieu of fines for regulatory violations, operators are offered the opportunity to do community service by plugging a comparable number of orphan wells selected by the state.
- Ohio** A landowner grant program has been established for the plugging of orphan wells, and \$200,000 has been set aside to fund this program. Letters are being sent to eligible landowners offering them the opportunity to get the orphan wells on their land plugged sooner by taking a more active role in the plugging process. Landowners must get bids from contractors (for a plugging program that complies with state regulations) and submit an application to the state. If approved, the landowner can have the well plugged and the state will reimburse the cost of plugging.
- Oklahoma** Oklahoma has established a Commission on Marginally Producing Oil and Gas Wells. The duties of this Commission include collecting information on marginal wells, distributing information to producers, proposing legislation and regulations to prolong production, and ensuring awareness of the economic contributions of marginal wells. A key aspect of the program is conducting



workshops, on-site demonstrations, and access to technical-assistance materials designed to transfer technical expertise that can prolong production. The Commission is funded by a fee on petroleum production in the amount of \$0.002 per barrel of oil and \$0.001 per 10,000 cubic feet of natural gas and casing head gas. Production exempted from severance tax is also exempted from this fee. Producers who elect not to participate may file at year's end for a refund of fees.

The Oklahoma Energy Resources Board was established in 1994 for the dual purpose of energy education and remediation of abandoned oil field sites. OERB is currently funded by a \$0.02 per barrel assessment on crude production in the state. Recent legislation replaces that levy with a 0.01 percent assessment on the gross wellhead value of both crude oil and natural gas. OERB conducts educational programs for schoolchildren, including explanations of the petroleum industry and oil field safety. OERB's enabling legislation requires that at least half of the funds received must be expended for environmental restoration.

## **Texas**

The Texas Experimental Research and Recovery Activity (TERRA) became effective January 1, 1996. This program gives the oil and gas industry and the Texas Railroad Commission (RRC) an alternative to prematurely plugging nonpolluting, mechanically sound wells. Operators with marginally producing wells that are not economical to operate may place their wells in the TERRA program by paying 75 percent of the RRC's estimated plugging costs in exchange for a release of plugging liability. Wells approved for plugging with state funds may be transferred to the TERRA program at 100 percent of the RRC's estimated plugging costs. The RRC requires that wells must meet certain criteria for acceptance into the TERRA program.

Operators or research institutions may be licensed to conduct research on enhanced recovery methods or to test new exploratory techniques without incurring a plugging liability on wells in the TERRA program. If circumstances change and the wells in the program become profitable again, operators may remove wells from TERRA at a cost of up to 200 percent of the RRC's estimated plugging cost.

The economic model for operation of the TERRA program has projected that at the end of four years, the program will have assets of \$9.6 million and liabilities of \$8.3 million. These projections are based on conservative estimates. The program is funded in the following ways: 1) industry wells accepted at 75 percent of the RRC's estimated plugging cost; 2) state-funded plugging wells transferred at 100 percent of the RRC's estimated plugging cost; 3) license fees to test a well or conduct research; 4) TERRA wells removed from the program at a cost of up to 200 percent of the RRC's estimated plugging cost; 5) salvage monies collected from equipment and hydrocarbons sold from wells plugged with state funds; 6) interest from the monies in the TERRA fund; 7) contributions and donations to the TERRA fund. As stated in the section on tax incentives, this program was not universally accepted by the industry and, therefore, the Commission did not fund the program in FY 2000.



**Table VI: State Incentives to Reduce or Prevent Idle Wells**

State	Description of Incentive	Current Incentives		Incentives Under Consideration
		Tax	Other	
<i>Alabama</i>	<ul style="list-style-type: none"> <li>Severance tax reduction of 50% for a period of 5 years.</li> </ul>	◆		
<i>Alaska</i>	<ul style="list-style-type: none"> <li>Royalty reduction for marginal reservoirs to initiate production from undeveloped oil and gas fields.</li> </ul>		◆	
<i>Arizona</i>	<ul style="list-style-type: none"> <li>Reduction of property tax assessment ration for producing wells to 25% from 100% of full cash value.</li> </ul>	◆		
<i>Arkansas</i>	<ul style="list-style-type: none"> <li>Severance tax reduction for incremental production resulting from enhanced oil recovery (EOR) projects or application of approved new technologies</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Ten-year severance tax elimination for idle wells brought back on line.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Permanent severance tax elimination for wells in idle fields brought back on line.</li> </ul>	◆		
<i>California</i>	<ul style="list-style-type: none"> <li>Operators must file a fee, bond, escrow account, or Idle Well Management Plan for all their unbonded idle wells.</li> </ul>		◆	
	<ul style="list-style-type: none"> <li>Operators allowed 90 days to attempt to bring idle wells back into production without assuming liability for plugging the well. "Take an orphan well for a test drive"</li> </ul>		◆	
	<ul style="list-style-type: none"> <li>Oil and gas assessment is waived for five-year idle wells returned to production after January 1, 1997.</li> </ul>	◆		
<i>Florida</i>	<ul style="list-style-type: none"> <li>Severance tax reduction from 8% to 5% for wells producing less than 100 bopd.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Tax exemptions under specific conditions.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Severance tax reduction from 8% to 5% for tertiary production.</li> </ul>	◆		
<i>Indiana</i>	<ul style="list-style-type: none"> <li>State is working with operators and industry associations to develop a voluntary plugging program.</li> </ul>			◆
<i>Illinois</i>	<ul style="list-style-type: none"> <li>Landowner Grant Program adopted to provide grants to landowners to plug abandoned wells on their own property.</li> </ul>		◆	
<i>Kansas</i>	<ul style="list-style-type: none"> <li>Ten-year severance tax elimination for idle wells brought back on line. To qualify, a well must have been inactive for 3 years.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Severance tax exemption for production resulting from a "tertiary" recovery process.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Severance tax exemption for marginal wells, as determined by oil and gas production and prices.</li> </ul>	◆		

**Table VI. State Incentives to Reduce or Prevent Idle Wells (Continued)**

State	Description of Incentive	Current Incentives		Incentives Under Consideration
		Tax	Other	
<b>Kansas continued</b>	<ul style="list-style-type: none"> <li>Severance tax exemption for 7 years given to the incremental production resulting from a production enhancement project begun after July 1, 1998.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Royalty relief tax refund. Relief from payment of ad valorem taxes.</li> </ul>	◆		
<b>Kentucky</b>	<ul style="list-style-type: none"> <li>A 100% credit on the severance tax for idle wells brought back into production.</li> </ul>	◆		
<b>Louisiana</b>	<ul style="list-style-type: none"> <li>Reduction of severance taxes on marginal wells.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Five year severance tax elimination for idle wells brought back on line. To qualify, a well must have been inactive for 2 years.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>50% severance tax reduction for wells incapable of producing more than 25 bopd, with at least a 50% water cut.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Wells incapable of producing more than 10 bopd, regardless of water cut, pay only 25% of the normal amount of severance tax.</li> </ul>	◆		
<b>Michigan</b>	<ul style="list-style-type: none"> <li>Severance tax reduction from 6.6% to 4% for oil wells classified as marginal or stripper (less than 5 bopd).</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Severance tax reduction from 5% to 4% for certain Antrim Formation gas wells.</li> </ul>	◆		
<b>Mississippi</b>	<ul style="list-style-type: none"> <li>Wells reactivated after two years are exempted from severance taxes for three years. This exemption ends July 1, 2003, or when oil exceeds \$20.00 bbl.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>A well producing less than 20 bbls/day from less than 7,500 feet and a well producing less than 40bbl/day from deeper than 7,500 feet receives a 2/3 reduction in severance tax as long as the average sale price is less than \$12.00 bbl.</li> </ul>	◆		
<b>Montana</b>	<ul style="list-style-type: none"> <li>Severance tax exemption for wells producing less than 3 bopd.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Severance tax reductions for incremental production from secondary and tertiary recovery projects.</li> </ul>	◆		
<b>Nebraska</b>	<ul style="list-style-type: none"> <li>Severance tax reduction from 3% to 2% for wells producing less than 10 bopd.</li> </ul>	◆		
<b>New Mexico</b>	<ul style="list-style-type: none"> <li>Severance tax reduction from 3.75% to 1.88% for approved secondary or tertiary production.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Ten-year severance tax exemption for idle wells returned to production.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Production restoration tax incentive. Reduced tax rate for wells idle for 24 months brought back into production.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Well workover tax incentive. Reduced tax rate for production from workover wells if well has an increase in production.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Stripper well tax incentive. Reduced tax rate for a well</li> </ul>	◆		
<b>North Dakota</b>	<ul style="list-style-type: none"> <li>Severance tax exemption for stripper wells.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Severance tax exemption for new wells drilled.</li> </ul>	◆		

**Table VI. State Incentives to Reduce or Prevent Idle Wells (Continued)**

State	Description of Incentive	Current Incentives		Incentives Under Consideration
		Tax	Other	
	<ul style="list-style-type: none"> <li>Severance tax exemption for new horizontal wells drilled or horizontal reentry.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Severance tax exemption for wells that have been inactive for at least 2 years that are returned to production.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Severance tax exemption for incremental production resulting from workover projects.</li> </ul>	◆		
<b>Ohio</b>	<ul style="list-style-type: none"> <li>Landowner Well Plugging Program</li> </ul>		◆	
<b>Oklahoma</b>	<ul style="list-style-type: none"> <li>Severance tax exemption for secondary enhanced recovery projects until project payout.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Severance tax exemption for tertiary enhanced recovery projects until project payout.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Wells inactive for 2 years or longer that are placed back in production are exempt from severance tax for 28 months.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Oil leases operating at a net loss or yielding a net profit less than the amount of severance tax paid may have their severance tax reduced from 7% to 1% as long as prices are below \$20/bbl.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Incremental production from wells enhanced by means of recompletion or workover is exempt from severance tax.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>New discovery wells are exempt from the levy of gross production tax.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Horizontally drilled wells are exempt from the levy of gross production tax.</li> </ul>	◆		
<b>Pennsylvania</b>	<ul style="list-style-type: none"> <li>Waiver of permit application fee for any orphan wells that an operator takes over in order to return them to production.</li> </ul>		◆	
<b>Texas</b>	<ul style="list-style-type: none"> <li>Ten-year severance tax exemption for inactive wells brought back on line. A well must have been inactive for 3 years to qualify.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Severance tax reduction from 4.6% to 2.3% for incremental production from EOR projects.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Ten-year severance tax exemption for inactive wells brought back into production. A well must have been inactive for 2 years to qualify.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Temporary severance tax relief for marginal wells. Emergency legislation to provide short-term severance tax relief for production between February 1, 1999, and July 31, 1999.</li> <li>Financial assurance for wells entering third year of inactivity. Financial assurance required for low producing wells transferred between operators. Annual fluid level testing to show well is environmentally sound.</li> </ul>	u		u
<b>Utah</b>	<ul style="list-style-type: none"> <li>Severance tax exemption for stripper wells.</li> </ul>	◆		

**Table VI. State Incentives to Reduce or Prevent Idle Wells (Continued)**

State	Description of Incentive	Current Incentives		Incentives Under Consideration
		Tax	Other	
<b>Utah (continued)</b>	<ul style="list-style-type: none"> <li>Severance tax exemption on a portion of workover/completion expenses for operations.</li> </ul>	◆		
<b>West Virginia</b>	<ul style="list-style-type: none"> <li>Severance tax credit for 50% of the value of incremental recovery for state approved enhanced recovery projects.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Severance tax relief.</li> </ul>	◆		
<b>Wyoming</b>	<ul style="list-style-type: none"> <li>Severance tax reduction from 6% to 4% for stripper wells and on incremental production resulting from tertiary oil recovery.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Severance tax reduction to 2% for production resulting from workovers/recompletions.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Crude oil and natural gas produced from wells drilled between July 1, 1993, and March 31, 2003, are exempt from severance taxes.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Crude oil extracted from collection wells is exempt from severance taxes.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Certain tertiary production projects exempt from severance taxes.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Crude oil produced from previously shut-in wells is exempt from severance taxes.</li> </ul>	◆		
	<ul style="list-style-type: none"> <li>Vented or flared natural gas and gas which is reinjected is exempt from taxation.</li> </ul>	◆		

## V. BUREAU OF LAND MANAGEMENT

The addition of data from the Department of the Interior's Bureau of Land Management (BLM) in the 1996 IOGCC Idle Well Study made that study more complete. The Ad Hoc Idle Well Committee of the IOGCC realized that due to the large areas of the western United States under the control of the BLM, no study would be accurate without including data from that federal agency.

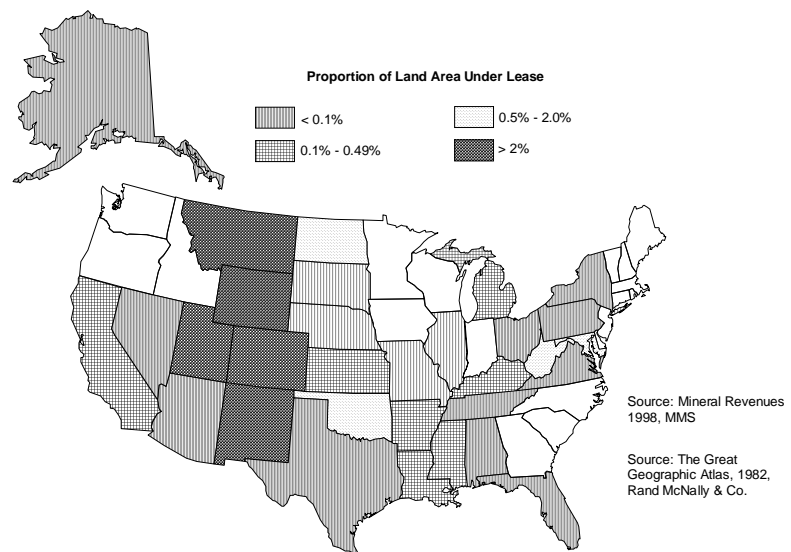
Currently, an estimated 11,148 wells are legally idle on BLM supervised lands. There is no estimate how many wells are illegally idle on those lands. The BLM has an internal study group looking at the orphan and idle well situation to determine the exact number of orphan wells. IOGCC states with large areas of federal public land are eager for BLM attention to the orphan well issue which can be addressed when it is quantified by this study.

The Mineral Leasing Act of 1920 gave the BLM the statutory authority to regulate idle wells on federal lands. The BLM is responsible for oil and gas operations on federal lands, and in conjunction with the Bureau of Indian Affairs (BIA), for most Indian lands. The major exception is the tribal lands of the Osage, where oil and gas operations are handled directly by the Osage Indian Bureau.<sup>13</sup> The authority to regulate wells and bonding on federal lands is contained in Title 43 of the Code of Federal Regulations section 3160 and in Title 25 for Indian lands. The BLM has the authority for bonding requirements on federal lands, while the Bureau of Indian Affairs has the final responsibility and authority for bonding requirements on Indian lands.

The map at right shows the large percentage of federal oil and gas leases for which BLM has the stewardship role for appropriate development. The BLM reports that nearly 128,000 wells have been drilled on lands under its supervision. Of those wells drilled, nearly 49,000 currently produce oil or natural gas.

Like the producing states, the BLM has recognized that appropriate development of oil and natural gas resources sometimes necessitates allowing wells to remain idle until economic conditions improve or until the well can be used in an enhanced recovery

**Onshore Federal and Indian Oil and Gas Leases**



<sup>13</sup> Since BLM has no jurisdiction on Osage lands, all information in this chapter excludes wells and requirements on Osage Indian lands.

project. The BLM implemented a policy in 1986 to avoid premature abandonment of marginal or stripper wells. This policy granted a suspension of producing obligations on these marginal leases for up to one year, with a royalty payment of \$1 per acre per year. These suspensions can be extended with BLM approval. In 1992, the BLM also reduced the royalty rate for stripper oil well properties to encourage operators of these properties to place marginal or unprofitable properties back in production and to provide an economic incentive to increase production by reworking marginal wells or implementing enhanced recovery projects.

The BLM does not use the term idle well. However, proposed regulations (43 CFR 3107.55) define an inactive well as any well that for the last 12 months has not: 1) produced oil or gas; 2) been actively used as a service well for disposal of produced water; 3) been actively drilled or reworked. Service use means a nonproductive completion used to support the production of oil or gas, such as injection, disposal, or observation purposes. All equipment for a shut-in well remains onsite and it can be produced or used for service by basically turning a valve or providing power to activate the pump. BLM reported approximately 11,000 shut-in oil and gas wells on federal and Indian lands as of September 30, 1994. An abandoned well is defined by the BLM as a well bore that has been plugged, but surface cleanup has not been completed. A temporarily abandoned well is defined as one which has been completed, is not capable of production in paying quantities, but may have future value as a productive or service well. Proposed regulations, CFR 3101.05, define a temporarily abandoned well as one which simply is not in use.

The BLM allows operators to use cash, surety bonds, certificates of deposit, letters of credit, U.S. Government Bonds, and U.S. Treasury Bills as security to insure the proper plugging of wells. There is no per-well bond, but the BLM accepts blanket bonds, the minimum amounts being: \$10,000 per lease, \$25,000 per state, and \$150,000 nationwide. The minimum security amounts are set by regulations, but the BLM field offices have the authority to increase the bond amounts as warranted. To deal with the problem of idle wells there are proposed regulations: 43 CFR 3107.14, contains additional bonding requirements; and 43 CFR 3107.56, contains new requirements for inactive wells.

With approval, wells on land under the supervision of the BLM can be temporarily abandoned. Future potential use is accepted by the BLM as justification for temporarily abandoning a well. To temporarily abandon a well, a permit is required and is valid for a period not to exceed one year. These permits are renewable and there is no limit on the number of times the permit may be renewed.

The BLM is concerned about the potential liability to the public from idle wells on public lands. Another anticipated result of the new BLM study will be the development of procedures to prevent idle wells from becoming orphan wells.

The U.S. government wants to keep wells on public lands from becoming idle. As an incentive to keep marginal wells producing, the federal government offers a royalty rate reduction for stripper oil properties.

## **VI. INTERNATIONAL AFFILIATES**



For the first time, the Idle Well Survey sought to include information from the international affiliates of the IOGCC. The IOGCC recognizes that many of the problems posed by idle wells in the United States do not exist in the countries which comprise its international affiliates.

Data was received from one of the International Affiliates, Alberta, and that information is included in this section. Although much of the idle well problem in the United States is not analogous to most of the international affiliates, this is not the case with Alberta. Alberta has a large number of onshore wells, a long history of oil and gas exploration, and actively seeks to regulate idle wells.

## **1. Definitions and Authority**

The Alberta Energy and Utilities Board (EUB) does not have a definition for idle well, but defines a suspended/inactive well as one for which production/injection/disposal volumes have not been reported for the previous calendar month. An abandoned well is defined as a well where the subsurface and surface abandonment has been completed in accordance with the requirements of the EUB and the required information has been filed with the EUB. Alberta does not have a definition for a temporarily abandoned well. The requirements of the EUB are incorporated in regulations.

The EUB began regulating oil and gas wells in Alberta in 1938. Regulation of plugging and abandonment procedures and ground water protection also were begun in 1938. Regulations relating to casing requirements were updated in 1972, 1973, 1976, 1981, 1982, 1984, 1990, 1995, and 1999. In 1997, Alberta initiated the Long Term Well Program. This is a five-year program to address wells that have been suspended more than 10 years. These wells must be abandoned, put on production, or an abandonment deposit put in trust with the EUB. In 1992, Alberta initiated the Orphan Well Program, and in 1993, legislation established the Orphan Well Fund. This program resulted in the oil and gas industry assuming the full cost of abandoning orphan wells.

The EUB shares the responsibility for regulation of idle wells with Alberta Environmental Protection and Alberta Department of Resource Development.

## **2. Security, Plugging, and Temporary Abandonment**

Currently the only type of security accepted to insure proper plugging of wells is cash. The EUB expects that in 2000 it will broaden the types of security accepted to include letters of credit. Alberta had accepted bonds and other forms of paper sureties in the past. The current system involves a per well deposit based on the estimated cost to abandon the specific well. This security was last modified in 1993. Presently, there are 2,579 non-abandoned wells covered by this security, and 124,895 wells which are not. Under the current program, the deposit is only released if the well abandonment has been completed, the well has been in production for six consecutive months, or the well is transferred to a new licensee who may or may not have to replace the deposit on the specific well. The amount of the deposit on a per well basis is never reduced.

In regard to requirement of a separate security for surface damages, subsurface damages, site closure, or reclamation, Alberta states that with expansion of their Orphan Program, separate

deposits for abandonment and reclamation will be covered. These deposits will be collected and held by the EUB.

If a licensee fails to complete the abandonment of a well when directed to do so by the EUB, a Formal Abandonment Order is issued. If the licensee fails to comply with the abandonment order, the EUB will complete the abandonment of the well. The EUB will then use the deposits for recovery of cost incurred for the abandonment of the well. If necessary, the EUB will initiate legal action against the licensee to recover any outstanding balance. If legal action puts a non-complying company out of business, any shortfall in the recovery of abandonment costs will be covered by the Orphan Fund.

In 1993, Section 56.1(1) of the Oil and Gas Conservation Regulations established an Abandonment Fund, which is to be administered by the EUB. The target amount when established was set at a minimum balance of \$2 million, which was increased to \$5 million in 1998. On March 31, 2000, the fund balance is expected to be between \$8 million and \$9 million. The funding for the Abandonment Fund is an annual levy against suspended / inactive wells licensed to oil and gas companies. The EUB reports that 230 wells have been plugged using this fund. There are currently 31 wells on the waiting list to be plugged. The main criteria for establishing a priority list for plugging is the risk to public safety or health and/or environmental hazard. Therefore, any leaking wells are addressed immediately.

No formal justification to temporarily abandon a well, or suspend a zone, is required. However, notification is required and details of abandonment or suspension must be provided to the EUB. Under the requirements of the Long Term Inactive Well Policy, the licensee must address all wells which have been inactive for more than 10 years. The licensee must abandon, place back into production, or put up a security deposit for these wells. The licensee has one year from the 10<sup>th</sup> anniversary date to take action. A well can only retain its suspended / inactive well status beyond 10 years, if a security deposit is filed for that well.

A mechanical integrity test is required for suspended wells. The Suspension Guidelines for Inactive Wells found in Interim Directive ID 90-4 identifies five different classes of wells, ranging from wells not completed to critical sour wells. The frequency of well head and casing integrity tests and inspection frequency is different for each class of well.

Alberta requires approval to permit injection wells to be suspended or abandoned. The operator of an enhanced recovery scheme must obtain approval from the EUB to suspend or terminate injection operations of any injection wells included in that scheme.

### **3. Data Collection**

The Alberta EUB requires monthly reporting for production. The EUB reports that most well data is collected and stored on an IDMS mainframe environment. Some data is actually transmitted as attachments to e-mail (well test data), or is received electronically on tapes or diskettes (production

data). Other data is received on paper and entered manually onto the mainframe systems, or in some cases, into PC-based spreadsheet programs. Almost all information is automated at some point during the capture cycle.

Alberta is not proactive in tracking idle wells. The EUB checks when production reports are not submitted when expected, but no action is taken when advised that the well has been suspended. Compliance with suspended well requirements is confirmed through a random audit process.

#### **4. Oil and Gas Well Data**

The EUB reports that at the end of 1998 a total of 202,845 wells had been drilled in the province of Alberta. Of that number, those producing are: 39,543 oil wells, 43,778 gas wells, and 6,000 service wells. A total of 75,371 wells have been plugged. Injection wells are classified as producing wells. There are a total of 33,500 wells, which are legally not producing. The EUB states that no wells are illegally idle at this time.

#### **5. Pre-regulatory Wells**

The first oil well was drilled in Alberta in 1902. There was very limited activity until 1908, when the first aspects of a regulatory scheme were initiated. The development of a regulatory framework continued on an ad hoc basis until 1938, when the Petroleum and Natural Gas Conservation Board was established. The PNGCB was the predecessor of the EUB. The EUB estimates that 776 wells were drilled prior to provincial regulation, and of that number 559 have been plugged and abandoned. Most, if not all of the pre-regulatory wells have been identified. All inactive pre-regulatory wells have been identified, and a majority of those wells have been plugged and abandoned. Information on the pre-regulatory wells is limited. Pre-regulatory wells are covered by the Orphan Fund if the licensee is insolvent.

#### **6. Method for Determining Future Use**

At this time, Alberta does not attempt to determine if an idle well has any future use. The EUB will likely make a list of orphan wells publicly available and provide some time for interested parties to come forward. If a well scheduled for plugging by the orphan fund is determined to have a future use, the EUB can direct the transfer of the well license to a responsible party for a \$10,000 transfer application fee. The EUB also has the option of deferring the abandonment to a subsequent year.

#### **7. Incentives and/or New Legislation for Idle/Abandoned Wells**

In 1997, the EUB initiated the Long Term Inactive Well Program. This program requires licensees to address wells, which have been suspended/inactive for more than 10 years. The EUB reports that annually 50-100 abandoned wells are re-entered and brought back into production. In the past, Alberta has offered reduced royalties as an incentive to keep marginal wells producing.

## **8. Liability or Asset Value of Idle/Abandoned Wells**

Alberta requires an operator to make downhole modifications. Those modifications depend on the classification of the well, and are required for security reasons and to reduce the final abandonment costs. The EUB has a salvage program, which can sell any salvageable equipment, as well as, oil contained in on-site storage vessels.

## **9. Description of Innovative Programs**

As mentioned above, the Long Term Inactive Well Program is designed to eliminate wells that have been suspended or inactive for more than 10 years. This program addresses approximately 1/3 of the current inventory of idle wells. The EUB reports that to date about \$1.5 million has been added to support its programs. The remaining additional costs have been assumed by the oil and gas industry. The EUB has a staff of 650, with about 25 staff dealing directly with orphan/idle well administrative activity.

# **VII. APPENDICES**

## **A. IOGCC GUIDANCE FOR STATE REGULATORY PROGRAMS WELL PLUGGING PRIORITIZATION SCHEDULE**

## Introduction

In December 1992, the Interstate Oil and Gas Compact Commission (IOGCC), in cooperation with the U.S. Department of Energy (DOE), published *A Study of Idle Oil and Gas Wells in the United States*. The study was an effort to demonstrate the interest of state regulatory programs in addressing idle wells and improving state programs where necessary. A result of that study were 11 recommendations for state regulatory officials to consider. One of the recommendations was that states establish a well plugging prioritization schedule. Because of that recommendation, a committee was formed to develop a prioritization schedule the states might use to allow individual wells to be “scored” in an unbiased manner. This 2000 update is intended to apply to those wells the state will be responsible for plugging because the operator is unknown or not solvent (also known as orphan wells).

This 2000 report represents the continuing effort of the IOGCC’s Council of State Regulatory Officials to strengthen state regulatory programs that relate to oil and gas by providing advice, guidance, and openly exchanging information. As with any guidance report, this document represents a suggested priority schedule for the states, and recognizes that a variety of factors will affect each state’s decision in establishing a schedule for plugging wells.

In establishing a prioritization schedule, the committee is aware of the states’ obligation in emergency situations where there is a risk to public health, safety, or the environment. It should be assumed that emergency situations will occur and require immediate response without the need for use of a priority schedule. Emergency situations are discussed in Section VII. A. 3. a. of this study.

### 1. Inventory

One aspect of an effective state regulatory program to prioritize well plugging should include an up-to-date inventory control system. The inventory control system should consist of:

- a. A mechanism to identify abandoned wells. (Physical location as well as tracking through permitting, etc.)
- b. A database that contains information covered in Section VII. A. 3. of this study, so it can be used to compare well plugging priorities.
- c. A plan on procedures that addresses abandoned wells and their plugging. (See Section VII. A. 3. a. i. (b). and (c). of this study.)
- d. Assistance in prioritizing well pluggings other than emergency situations.

It is recognized that the cost of developing, implementing, and maintaining an accurate inventory control system might not currently be included in state agency budgets and, further, that this expense in some states may be significant. It is recommended that state agencies investigate cost effective systems and use every means at their disposal to attempt to fund these activities.

## **2. Innovative Approaches To Conserve Oil And Gas Resources**

As the original study on idle wells began to illustrate, state regulatory agencies are initiating efforts to identify idle wells. The original study did not address abandoned wells. Abandoned wells are that class of pre-regulatory wells, not plugged, and with no known operator. As the number of wells requiring plugging with state funds increases, states must look at multiple options to address them.

One of the priorities in this effort should be consideration of agendas that allow for continued access to the resource. As some states already have discovered, many idle and abandoned wells have value. In these cases, operators are willing to assume the plugging responsibility for the right to recondition and operate the well.

To identify those idle and abandoned wells that have potential value, state regulatory agencies need to have the ability to publish information on those wells. A central database that contains an inventory of those idle and abandoned wells would allow states to publish the entire array or specific wells in an area of interest.

California has an innovative approach to bringing idle wells back into production. As mentioned in Section IV, California SB 2007 allows an operator to adopt an orphan well without liability in the hopes of returning the well to active status. Therefore, published information on idle wells in California could generate interest among oil and gas operators.

Another innovative approach to conserving the resource is found in many states which have passed legislation exempting an operator from paying severance taxes on a well producing only marginal amounts of product. Identifying the wells and publishing a list of those wells, which meet the criteria set by the respective states, would allow interested operators to bring idle wells back into production.

## **3. Plugging**

### **a. Emergency Situations**

As mentioned in the introduction, "it should be assumed that emergency situations will occur and require immediate response," which places these wells at the top, or first, on any regulatory program's prioritization schedule. It may be necessary for the state to respond to an emergency situation for wells that have a solvent operator in place. All other well prioritization in this section deals with orphan wells.

#### **i. Items to Consider to Prepare for Emergencies**

- (a). First Priority - risk to public health, safety, or the environment, e.g., uncontrolled flow (H<sub>2</sub>S, gas, oil); leaking well causing contamination of ground water or surface water.
- (b). States must have the authority and means to address emergency situations. Clear statutory authority must be in place to allow the regulatory agency the ability to act on an emergency to include appropriate funding for these occurrences.

- (c). States must have mechanisms in place to address emergencies when they occur. This includes a properly educated staff, coordination mechanisms with other agencies, and a procedural contingency plan to ensure that a situation is dealt with efficiently and effectively.

- b. Prioritization

Following is a chart for prioritizing well plugging. A points system should be developed to make the process as objective as possible. It is recognized that different conditions exist from state to state and within regions of a state (geology, climate, practices, etc.), and because of these conditions, each state will want to individualize a well plugging priority schedule to suit its needs.

- c. Point System

A number of states have developed a points system to prioritize well plugging. Appendix B contains examples of a few of the states' well plugging prioritization points systems.

Item	Well**		Site Location*	Remarks	Score
	Surface Condition	Subsurface Condition			
Leaking Well ( <i>circle all that apply</i> ): H <sub>2</sub> S, Gas, Oil, Water, Brine (Volume may be factor)					
Well with Pressure					
Ground water: Minor aquifer Major aquifer Public supply					
Surface Water: Public Supply					
Open Hole					
Geologic Consideration Reservoir Surface and ground water					
Age of Well					
Environmental ( <i>circle all that apply</i> ): Wetlands Endangered species Public land Wildlife Domestic animals					
Land Use ( <i>circle all that apply</i> ): Distance to dwellings, people, rivers Agricultural land Number of people Roads or highways					
Other/Special Conditions (Complaints)					
<b>Total Score</b>					

\* List letter (a) Distance to dwellings, people, rivers; (b) Type of dwellings; (c) Agricultural land; (d) Size of population; (e) Roads or highways.

\*\* For specific mechanical considerations, refer to API Bulletin E3 (BUL E3) First Edition, January 31, 1993, Environmental Guidance Document: Well Abandonment and Inactive Well Practices for U.S. Exploration and Production Operations.



**B. PROCEDURES USED BY STATES FOR PRIORITIZING WELLS  
TO BE PLUGGED WITH STATE FUNDS**

**1. Louisiana's Orphaned Well Plugging Prioritizing System**

<b>No.</b>	<b>Factors</b>	<b>Score</b>
1a	Leaking well– natural gas– within 100m of a public building or residence	32
1b	Leaking well – natural gas	14
1c	Leaking well – water or oil >1 bbl/day	30
1d	Leaking well – water or oil <1 bbl/day	10
2a	Hazard to navigation –well submerged or at surface	28
2b	Hazard to navigation – well in navigable waterway (boat hazard)	20
2c	Well in any other body of water (creek, stream, swamp, etc.)	12
3	H2S possible or present	2
4a	Well not leaking but under pressure	8
4b	Well not leaking, pressure status unknown	6
5	Well not leaking, pressure > 500 psi	2
6	No wellhead or wellhead damaged	4
7	No production casing/open hole	2
8a	Production site/pit contaminated substantially	3
8b	Production site/pit contaminated minimally	1
9a	Within 100 m of public water supply (aquifer, well, or surface water)	8
9b	Within 100 m of public building/facility used by public on a recurring basis, or a residence	7
9c	Within 100 m of surface water or wetland	7
9d	Within 100 m or habitat containing rare, threatened, or endangered species (plants and animals)	4
9e	Within 400 m of residential or urban development	3
9f	Within 400 m of surface water or wetland	2
9g	On land actively managed for crops or forage (pasture)	1

Instructions:

1. Assign the appropriate factors to a site.
2. For factors with more than one option in a category, e.g., 4a & 4b, assign only one option.
3. Total all the assigned factor scores for the site.
4. Use the total score and the priority table to set the site priority.

<b>Priority Table</b>	
<b>Priority</b>	<b>Score</b>
Priority 1	> 30
Priority 2	> 19
Priority 3	> 10
Priority 4	10 and under

## 2. Michigan's Well Plugging Priority System

### Scoring Improperly Plugged Wells

#### *Category I Actively Leaking Wells*

First Priority, Water Wells contaminated

#### SAP SCORE

H<sub>2</sub>S Concentration [1-10, 2; 11-300, 3; 301-1000, 4; >1000, 5; unknown, 4]

Second Priority, Leaking Oil, No Water Wells Contaminated

#### SAP SCORE

H<sub>2</sub>S Concentration [1-10, 2; 11-300, 3; 301-1000, 4; >1000, 5; unknown, 4]

Third Priority, Leaking Brine or Gas, No Water Wells Contaminated

#### SAP SCORE

H<sub>2</sub>S Concentration [1-10, 2; 11-300, 3; 301-1000, 4; >1000, 5; unknown, 4]

#### *Category II Abandoned Unplugged Wells*

SAP SCORE, if any

If no SAP SCORE:

Water Wells Within 1/4 Mile [Yes 2, No 0]

Potential Resources Affected [One Pt Each, GW, SW, Air, Wetlands, Soils]

Pressure @ Surface [1-10#,1; 11-100#,2; >100#,3; unknown, 2]

Age [<1940, 3; 1940-1973, 2; >1973, 1]

Vessels with Fluid Present [Yes 4, No 0]

Injection Wells completed in a formation equal to or shallower than within

mile [Yes 4, No 0]

Ex-producer [Yes 2; No 0]

H<sub>2</sub>S Concentration [1-10, 2; 11-300, 3; 301-1000, 4; >1000, 5; unknown, 4]

Cable/Rotary [Rotary 1, ; Combination 2; Cable 3]

Formation @ T.D. [< TR, 1; TR-DD, 2; DD-A<sub>2</sub>, 3; A<sub>2</sub>-PDC, 4]

### 3. Pennsylvania's Well Plugging Priority System

**Commonwealth of Pennsylvania  
Department of Environmental Protection  
Bureau of Oil and Gas Management  
Orphan Well Priority Form**

BOGM Tracking # \_\_\_\_\_

API # \_\_\_\_\_

Date Reviewed: \_\_\_\_\_

- |   |                        |
|---|------------------------|
| A. With Public Lands - Parks (25), Game Lands (20), Forests (15), Other publicly owned land with no specified use (10)  | <u>Points</u><br>_____ |
| B. Private Land Use - Residential (20), Industrial (15), Agricultural (10), Other privately owned land with no specified use, such as a vacant lot or undeveloped tract (5) | _____                  |
| C. Within 200 Feet of Public Water Supply or Public Accessible Area or Building - Within 100 Feet (15), Within 200 Feet (10)  |                        |
| D. Within 200 Feet of Private Water Supply or Occupied Private Building - Within 100 Feet (10), Within 200 Feet (5)   |                        |
| E. Within 200 Feet of Stream or Body of Water - Within 100 Feet (6), Within 200 Feet (3)  |                        |
| F. In Special Protection Watershed Exceptional Value (10), High Quality (8)   |                        |
| G. Within a Wetland - (8)   |                        |
| H. Other (0 - 6) _____<br>_____   |                        |

TOTAL POINTS: \_\_\_\_\_

*Comments:*

Reviewer \_\_\_\_\_

**Commonwealth of Pennsylvania  
Department of Environmental Protection  
Bureau of Oil and Gas Management  
Abandoned Well Priority Form**

BOGM Tracking # \_\_\_\_\_

Date Reviewed: \_\_\_\_\_

- |   |                        |
|---|------------------------|
| A. Public Water Supply Affected (0 - 20)  | <u>Points</u><br>_____ |
| B. Private Water Supply Affected (0 - 15)   |                        |
| C. Public Safety Threatened - same conditions exist as under emergency action except current methods of control are effective and there is <u>no imminent</u> danger, but potential still exists (0 - 30) | _____                  |
| D. Surface Water Affected (0 - 10)  |                        |
| E. Other Types of Water Supply Affected (0 - 10)  |                        |
| F. Ground Water Affected (0 - 10)   |                        |
| G. Well Integrity Threatened (0 - 10)   |                        |
| H. Other (0 - 10) _____<br>_____  |                        |
| TOTAL POINTS:   | _____                  |

*Comments:*

*Reviewer* \_\_\_\_\_

#### **4. Texas' Well Plugging Priority Determination Procedures**





















## **C. OHIO LANDOWNER WELL PLUGGING PROGRAM**











## **D. Louisiana Idle Well Status Codes**



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