WORKING WITH OIL AND GAS RULES AND REGULATIONS*

A. D. BOND
Mobil Oil Corporation

INTRODUCTION

Almost everyone connected with the oil and gas business will, at one time or another, be faced with rules and regulations governing oil and gas operations. The purpose of this paper is to present a generalized concept of some of the laws adopted by the various regulatory agencies in Texas and New Mexico. To completely encompass all rules and regulations in effect in the space and time allotted would be impossible. But, by supplementing the information contained in this paper with the reader's own knowledge and that available from other sources, one may gain a broader perspective of this particular phase of the oil and gas industry as well as a more complete understanding of the workings of the regulatory bodies.

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* Most of the material contained in this paper is based on personal observation and experience over the past several years and orders and memorandums adopted and published by the New Mexico Oil Conservation Commission and the Texas Railroad Commission. The history and organization of these two regulatory agencies were compiled from information taken from R.W. Byram's *Oil & Gas Handbook,* Commission publications and interviews with Commission personnel.

It is not the intent of this paper to present the official position, view or policy of any regulatory agency mentioned. Neither shall the contents of this paper be binding on the author nor Mobil Oil Corporation.

REGULATORY AGENCIES

Before discussing the application of rules and regulations, consider some of the agencies responsible for adopting and enforcing them in this part of the country. See Fig. 1.

TEXAS
RAILROAD COMMISSION
WATER DEVELOPMENT BOARD
WATER QUALITY BOARD
AIR CONTROL BOARD
UNIVERSITY LANDS
GENERAL LAND OFFICE
FEDERAL GOVERNMENT

NEW MEXICO
OIL CONSERVATION COMMISSION
STATE LAND OFFICE
STATE ENGINEER
FEDERAL GOVERNMENT

FIG. 1—OIL AND GAS INDUSTRY REGULATORY AGENCIES

Because the oil and gas industry is primarily regulated by the Railroad Commission in Texas and the Oil Conservation Commission in New Mexico, this paper will mainly be concerned with the functions of these two agencies. However, a brief explanation of the other agencies will be given.

In Texas, the Water Development Board recommends depths to which usable quality water should be protected. The Water Quality Board

issues waste well disposal permits for non-oil industry usage and checks casing programs for salt water disposal wells. (The Railroad Commission issues salt water disposal well permits.) The Air Control Board is responsible for setting standards and regulating emissions of air pollutants connected with oil and gas operations. The Board for Lease of the University of Texas Lands, commonly called "University Lands", administers the affairs of some 2½ million acres of land granted to the University of Texas and Texas A & M for educational purposes. The General Land Office looks after the interest of all State-owned land.

The Federal Government becomes involved in both Texas and New Mexico through environmental matters, taxation, and price regulation. Also, whenever conducting oil and gas operations on Federal lands, it is necessary to deal with the Federal Government through the United States Geological Survey and the Bureau of Land Management.

In New Mexico, the Office of the Commission of Public Lands or State Land Office administers the affairs of State-owned land. The State Engineer grants water rights for secondary recovery projects. The Federal Government's role has already been mentioned.

Texas Railroad Commission

The Texas Railroad Commission, headquartered in Austin, administers the rules and regulations governing oil and gas operations in Texas. The Texas Railroad Commission became the regulatory agency for the oil and gas industry as a result of the Legislature declaring pipelines to be common carriers. The first assignment of oil and gas regulations to the Railroad Commission was the enactment of Senate Bill 68, which was approved by the Legislature on February 20, 1917. This law, entitled "An Act to Regulate Pipelines", declared pipelines to be common carriers and placed them under the supervision of the Railroad Commission. It provided that the Commission should promulgate and enforce rules and regulations for the prevention of waste and of practices dangerous to life and property. The need then arose to regulate the producing phase of the industry. Rather than establishing a new agency, the Legislature granted the Railroad Commission this authority under a statute which became effective June 18, 1919. The Railroad Commission immediately hired Professor George C. Butts from the University of Texas School of Law to organize the Oil and Gas Division. This task was practically completed within a year.

Soon after the organization of the Oil and Gas Division commenced, the first Statewide Rules governing production were adopted on July 26, 1919. These were Rules one (1) through 35. Rules 36, 37 and 38 were adopted on November 26, 1919. Since that time additional rules have been adopted bringing the total to more than 60. Of all the rules adopted, Rule 37 is the only rule that bears the original number. Rule 37 is the Statewide spacing rule which will be discussed later in this paper.

The Railroad Commission is an elective board containing three members who are elected for a term of six years. The terms of the Commissioners are staggered so that only one is elected every two years and the other two are held over.

The Railroad Commission was reorganized in 1963. An Administrator was appointed to act as a coordinator between the Commissioners and five Division Directors. Figure 2 is an organizational chart of the Railroad Commission showing these five divisions. They are the Administrative Services, Gas Utilities, Liquefied Petroleum, Oil and Gas, and Transportation.

The Oil and Gas Division is directed by the Chief Engineer with close cooperation of the Chief of Staff Service who is the Director of Administrative Services. Figure 2 shows the breakdown of responsibilities within each of these two divisions.

Reporting to the Chief Engineer are the Director of Field Operations, Director of Technical Hearings, Legal Counsel, Director of Production and Proration, and the Director of Research and Inspection.

The Director of Field Operations supervises the work of field offices located outside Austin. These field offices are headed by a District Director.

The Director of Technical Hearings schedules hearings and supervises examiners who conduct these hearings and handles other matters of an engineering and geological nature. This would include field rule adoptions, exceptions and amendments to field rules, pressure main-

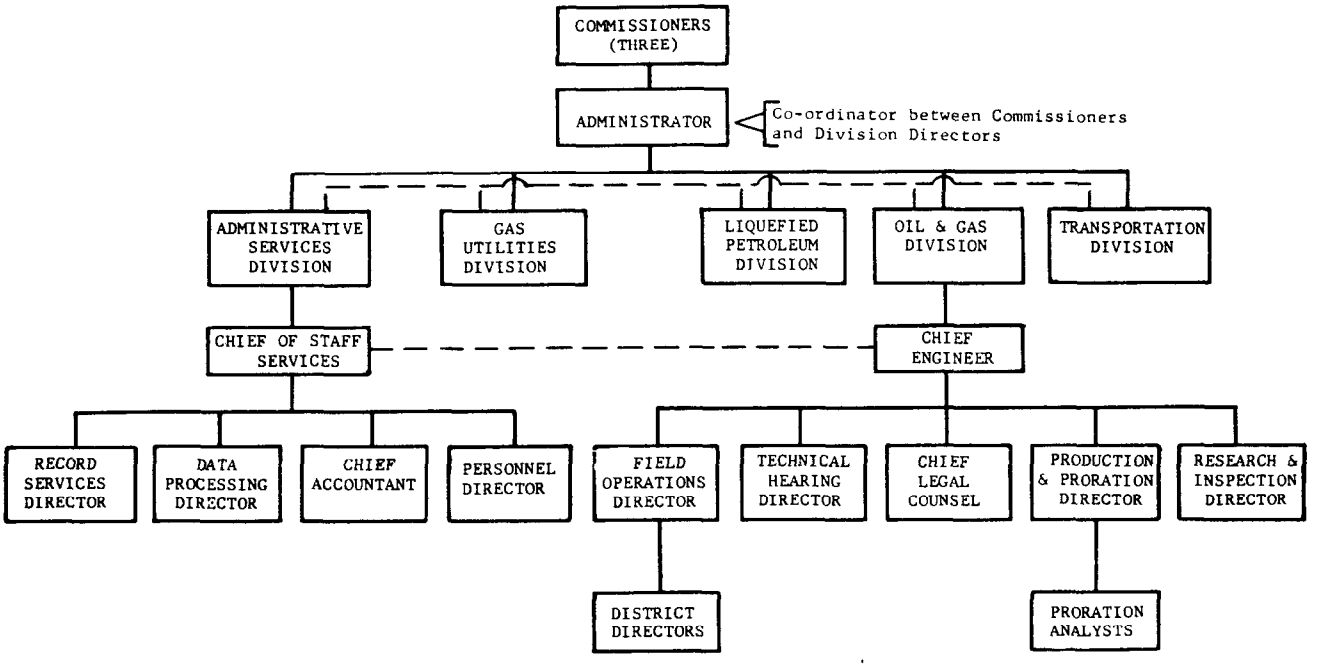

FIG. 2—ORGANIZATIONAL CHART OF THE TEXAS RAILROAD COMMISSION

tenance and secondary recovery projects.

The Chief Legal Counsel is in charge of examiners who conduct hearings on wells that violate spacing rules. He also advises on matters of legal nature.

The Director of Production and Proration directs the work of proration analysts who are responsible for assigning allowables to oil and gas wells and the recording of production. He is also responsible for uniform application of the field rules.

The Director of Research and Inspection is familiar with all the regulations and policies of the Oil and Gas Division, especially as to the practical applications of the rules. He also makes a study of proposed and/or recommended regulatory changes to determine the effect these changes might have on a field, an area or the entire state.

The Record Services Director, Data Processing Director, Chief Accountant and Personnel Director report to the Chief of Staff Services.

The Record Services Director is in charge of Central Files where all records are kept. This section also issues surface commingling permits, and drilling permits on wells that do not violate field rules.

The Data Processing Director is responsible for printing the oil and gas schedules and other production reports. The duties of the Chief Accountant and Personnel Director need not be discussed in this paper.

New Mexico Oil Conservation Commission

New Mexico has always been a leader in oil and gas conservation. The first commercial oil well was discovered in 1909 near the town of Artesia. While no other oil or gas well of commercial value was discovered until 1922, the Legislature adopted rules and regulations governing the casing and plugging of oil and gas wells in 1912.

In 1925 the Legislature passed a law which authorized the Governor to appoint a State Geologist with the authority to prescribe and enforce rules and regulations necessary to prevent waste and conserve the State's natural resources. From 1930 to 1935, well density and production were controlled by a cooperative agreement among operators with the approval of the State Land Commissioner and the State Geologist.

Significant hydrocarbon finds in the early 1930's prompted the Legislature to adopt a

comprehensive oil and gas statute. In 1935, the Legislature enacted Chapter 72, Laws of 1935, which contained the basic provisions of New Mexico's present oil and gas conservation act. It was this act that created the New Mexico Oil Conservation Commission. Figure 3 is an organizational chart of the Conservation Commission.

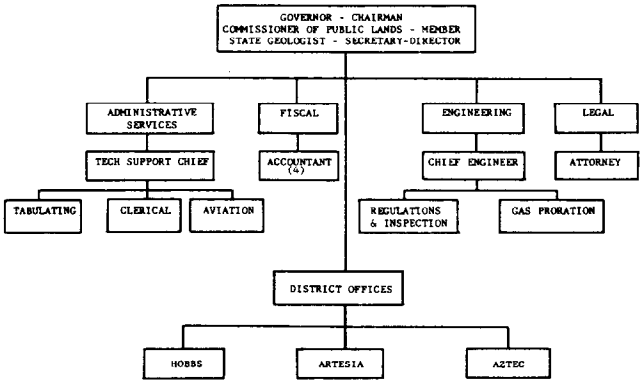

FIG. 3—ORGANIZATIONAL CHART OF THE NEW MEXICO OIL CONSERVATION COMMISSION

The Commission is composed of the Governor, Chairman; State Geologist, Secretary-Director and executive head; and the Commissioner of Public Lands. The main office and a district office are located in Santa Fe. Other district offices, located in Hobbs, Artesia and Aztec, are headed by an Oil and Gas Inspector who reports to the Secretary-Director.

RULES AND REGULATIONS

Anyone can enter into the oil business in Texas and New Mexico provided he is willing to file a Form P-5 (Organization Report) to operate in Texas and post a $10,000 plugging and indemnity bond for New Mexico.

As stated in the introduction, to cover each and every situation that might arise in day-to-day operations would be impossible in the time allotted; therefore, only a few of the more important ones will be discussed.

The rules for each state clearly say that drilling shall not commence until the application to drill has been approved. To get such an application approved routinely, a proposed well must:

1. Be located a specified minimum distance from the lease or subdivision line
2. Be located a certain minimum distance from another well on the lease producing from the same pay
3. Be located on a proration unit containing a certain number of acres
4. Have a casing program to adequately protect usable quality water-bearing sands.

Exceptions to 1, 2, and 3 above may be granted by the Commission for good cause, either administratively or after notice and hearing.

The rules and regulations for each state will be discussed separately.

TEXAS—RULES AND REGULATIONS

In Texas, there are three types of field rules under which oil and gas wells may be drilled. These are Statewide, Districtwide and Special. Statewide field rules are set forth in Statewide Rule 37. This rule covers all wildcat wells and all other wells both oil and gas not covered by Special or District-wide rules. Because of the nature of the geologic structure, Rule 37 does not apply to most salt dome fields. Rule 37 provides that a well be located a minimum distance of 467 ft from the nearest lease line and 1200 ft between wells on the same lease producing from the same reservoir. It also provides that a well, oil or gas, be located on a tract of land consisting of at least 40 acres.

District-wide rules (North Texas General in this paper) govern drilling of most wells above 5000 ft in Railroad Commission Districts 7B and 9, and one county in District 7C. When wells are drilled in this area, they are automatically placed in fields called "County Regular Fields." For example; all wells drilled in Wichita County are placed in Wichita County Regular Field, those in Brown County are in the Brown County Regular Field, etc. An operator may petition the Commission to place his wells in something other than a County Regular Field. In this case, he must request a new field designation from the Commission. Wells completed below 5000 ft are governed by either Statewide or Special rules. Figure 4 shows the spacing, density, and allowable of County Regular wells at different depths.

DEPTH	SPACING (MINIMUM DISTANCE FROM LEASE LINE AND BETWEEN WELLS)	DENSITY (MINIMUM SIZE OF PRORATION UNIT)	ALLOWABLE (BOPD EXEMPT FROM PRORATION)
0'- 2000'	150'- 300'	2.06 AC.	16
2000'- 4000'	330'- 660'	10.00 AC.	28
4000'- 6000'	330'- 933'	20.00 AC.	35
6000'- 8000'	467'- 1200'	40.00 AC.	40

FIG. 4—COUNTY REGULAR FIELD WELLS

Special field rules would then cover the remainder of the wells. These rules are adopted when it is apparent that Statewide or District-wide rules will not provide proper reservoir control and depletion. Special rules are adopted after a hearing is held before the Commission. These may be Commission-called hearings, but they are usually requested by the operator or operators in the field. The hearing is held only after proper notice of such hearing has been given to all interested parties. In many cases temporary rules are adopted in the early life of a field before the discovery allowable has expired. Temporary rules are adopted to assure orderly development of a field by regulating well spacing and density. In case of a gas well, field rules might also be adopted to gain additional allowable since discovery allowable for a gas well is only 25% of the calculated absolute open flow. Whether it would be advantageous to retain discovery allowable for an oil well would depend on the market demand factor. For example, if 80-acre density is adopted for a reservoir producing from 10,000 ft, wells would have a higher allowable under the 1965 yardstick, provided the market demand factor is above 70% (300 BOPD—1965 Yardstick x 0.75—Market Demand Factor = 225 BOPD versus a Discovery Allowable of 210 BOPD). More consideration will be given this matter when allowables are discussed. Temporary field rules are reviewed usually within a year to determine their effectiveness. Generally, these rules are made permanent at that time and seldom are any changes made. The more common provisions contained in a set of field rules appear in Fig. 5.

The spacing rule establishes the minimum distance to the nearest lease line that a well can be drilled and the minimum distance between wells on the same lease producing from the same pay. These two distances may range from 150 ft to 1867 ft from the nearest line and from 300 ft to 3735 ft between wells. For example,

1. SPACING

2. DENSITY

3. SURFACE CASING REQUIREMENT

4. GAS OIL RATIO

5. ALLOCATION FORMULA (ALLOWABLE)

FIG. 5—COMMON PROVISIONS FOUND IN SPECIAL FIELD RULES

an oil well above 2000 ft in North Central Texas may be located 150 ft from the line and 300 ft from the nearest well; whereas, a deep gas well in West Texas, after field rules are adopted, would likely have to be a minimum of 1867 ft from the nearest lease line and 3735 ft from the nearest well on the same lease. If for some reason, whether it be topographic, lease configuration, or geological, it is necessary to drill a well at a location less than the field rules specify, a special permit must be requested. This type of permit will be granted to prevent the confiscation of property. It should be pointed out that a special permit will not necessarily be granted to drill a well at a distance closer to the lease line than the field rules provide just because a well across the lease line happens to be closer.

An application for a special permit is usually referred to as an "Exception" to or an "Exception under Statewide Rule 37". It is processed by the Rule 37 Department of the Oil and Gas Division in Austin. The Rule 37 Department can, under certain conditions, approve these applications administratively. In the absence of waivers from offset operators, these applications will be set for hearing. Notices of the hearing will be sent to all interested parties and no hearing will be held without at least a 10-day notice. This is necessary to allow time to prepare testimony to be presented at the hearing. If an operator can furnish waivers of objection from all offset operators to the Commission after the hearing has been set, the Commission will probably cancel the hearing and issue the permit administratively.

The density rule establishes the size of the proration unit or the amount of acreage necessary on which to drill a well. Statewide Rule 38, which applies to wells not covered by Special or District-wide field rules, provides that no well shall be drilled on a proration unit con-

taining less than 40 acres. Under district-wide and special field rules, the size of proration units varies from 2.06 acres for the shallow pools of North Texas to 640 acres for the deep pools of West Texas. To drill on less than a standard size proration unit, regardless of the field, an exception to, or under Statewide Rule 38, will be necessary. In case of a lease containing less acres than that required for a standard unit, a Commission Form X-109 should be submitted with the drilling application. This form states that the lease has not been subdivided from a larger tract subsequent to the adoption of density rule, whether it be Special, District-wide, or Statewide. All acreage in a proration unit must be contiguous and continuous unless it is traversed by a narrow strip of land such as a highway, railroad, canal, etc., and the minerals are owned by another party. These small strips of land, as well as others not large enough to drill on, are candidates for forced pooling under the Mineral Interest Pooling Act.

The surface casing rule is for the protection of usable quality water sands as determined by the Texas Water Development Board. If this requirement is not included in a set of field rules, it will be necessary to contact the Water Board on each new well. The amount of surface casing required to protect water-bearing sands in a wildcat well would have to be requested from the Water Board since there would be no field rules.

Statewide Rule 49 sets the statewide gas-oil ratio at 2000:1 (2000 cu ft of gas to one bbl of oil). This rule is to establish the gas limit for a field; and, unless special conditions of a reservoir dictate otherwise, the statewide gas-oil ratio will be used when special field rules are adopted. The gas limit is determined by multiplying the gas-oil ratio by the top well allowable for the field. If the GOR is set at 2000:1 and the top oil well allowable is 80 BOPD, the daily gas limit is 160,000 cu ft. Should a well be completed with a gas-oil ratio of 4000:1, its daily oil allowable would be penalized to 40 bbl, determined by dividing the daily gas limit (160,000) by the gas-oil ratio (4000). Wells with high gas-oil ratios may avoid allowable penalties, however, if permission is obtained to divert the excess gas to legal use; i.e., fuel, or re-injected into reservoir from which produced to maintain or increase pressure which in turn would increase ultimate recovery. A request for an exception to the gas-oil ratio rule may be made for one or more wells or for an entire field. Such a request will be approved, however, only after notice and hearing before the Commission.

The allocation formula determines how the allowable will be allocated between the well and the proration unit. For a long time the allowable was divided equally between well and acreage. This later changed to 25% per well and 75% acreage. The trend today is that the allowable is based 100% on acreage. Occasionally other factors; i.e., acre ft, and bottomhole pressure are made a part of this formula.

After a well has been drilled and completed, the paper work filed and approved, the next step is to start producing and selling the crude. The question is "How much will the well be allowed to produce?" Before discussing allowables, consideration should be given to the paper work involved from the drilling application through the authority to produce. Figure 6 shows the flow of this paper work.

Allowables

During the life of an oil well it may produce under several different allowables. Figure 7 is a table showing these various allowables. If a well is drilled as a wildcat, completed as a producer, and the Commission approves it as a discovery, it will be assigned a discovery allowable. For example, a discovery well completed between 9500-10,000 ft will be allowed to produce at a rate of 200 BOPD. This allowable is based strictly on depth and is exempt from proration.

Discovery allowable is good for 24 months from the date the first well is discovered or until the eleventh well has been completed, whichever comes first. Discovery allowable for offshore wells expires after 18 months or the sixth well, whichever comes first. The purpose of this allowable is to encourage exploration in that it gives the operator a chance for a quicker return on his investment. Due to the high market demand factors of today, this allowable isn't as attractive as it once was.

The 1965 Yardstick Allowable was adopted and made effective on January 1, 1965 to encourage wide-spacing. All oil wells drilled prior to this time had their allowables assigned in ac-

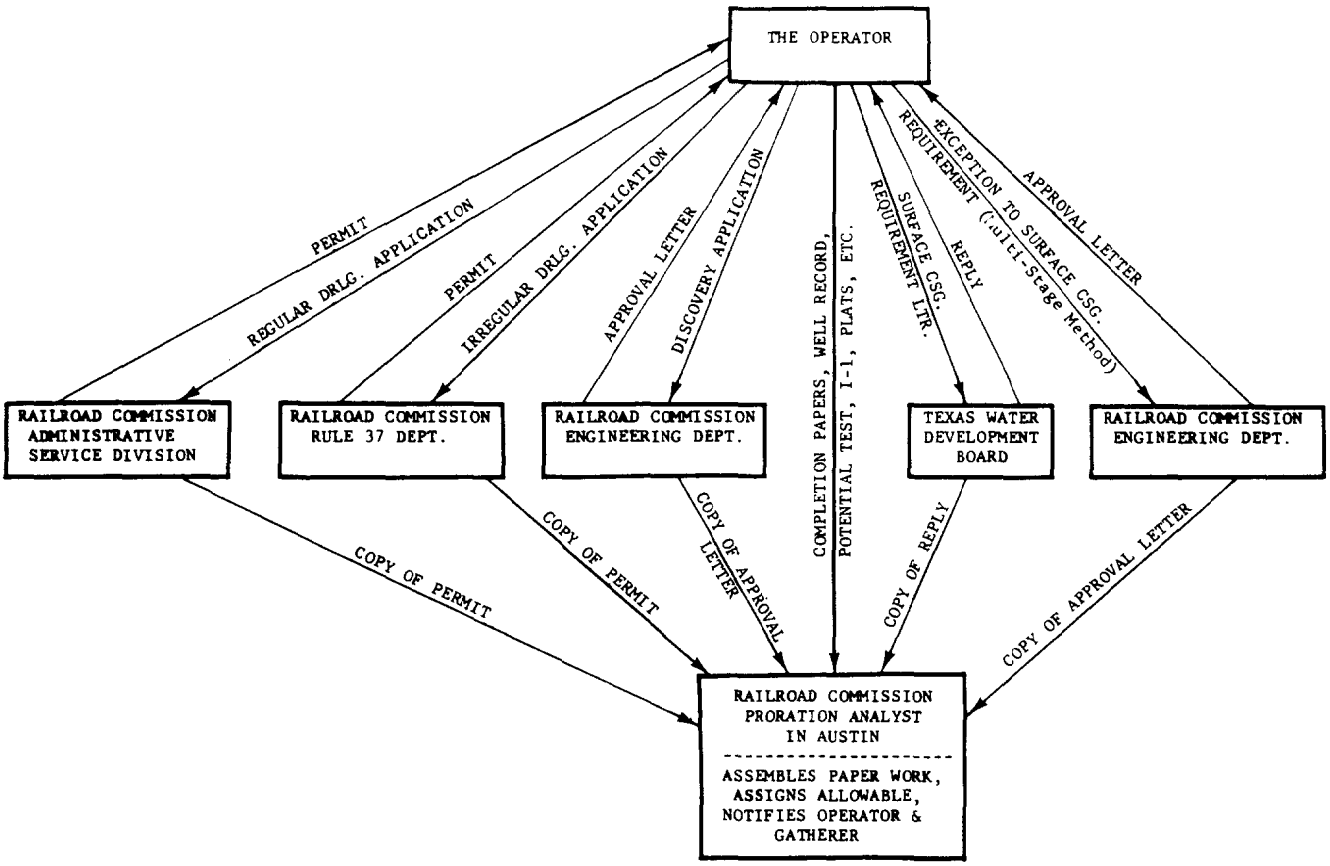

FIG. 6—PAPER WORK FLOW—TEXAS WELL

	Allowable Yardsticks - Subject to Proration										Not Subject to Proration			
	(1) 1947 Allow. Yardstick			(2) 1965 Allow. Yardstick					(3) 1966 Offshore Allowable Yardstick			(4)	(5)	(6)	
Depth	10 Ac.	20 Ac.	40 Ac.	10 Ac.	20 Ac.	40 Ac.	80 Ac.	160 Ac.	40 Ac.	80 Ac.	160 Ac.	Discovery (Allowable	Co. Regular Based on Depth		Marginal only)	Depth
0 - 1,000	18	28		21	39	74	129	238	200	330	590	20	Class 1	16	10	0 - 1,000
1,000 - 1,500	27	37	57	21	39	74	129	238	200	330	590	20	Class 1	16	10	1,000 - 1,500
1,500 - 2,000	36	46	66	21	39	74	129	238	200	330	590	40	Class 1	16	10	1,500 - 2,000
2,000 - 3,000	45	55	75	22	41	78	135	249	220	360	640	60	Class 2	28	20	2,000 - 3,000
3,000 - 4,000	54	64	84	23	44	84	144	265	245	400	705	80	Class 2	28	20	3,000 - 4,000
4,000 - 5,000	63	73	93	24	48	93	158	288	275	445	785	100	Class 3	35	25	4,000 - 5,000
5,000 - 6,000	72	82	102	26	52	102	171	310	305	490	865	120	Class 3	35	25	5,000 - 6,000
6,000 - 7,000	81	91	111	28	57	111	184	331	340	545	950	140	Class 4	40	30	6,000 - 7,000
7,000 - 8,000	91	101	121	31	62	121	198	353	380	605	1,050	160	Class 4	40	30	7,000 - 8,000
8,000 - 8,500	103	113	133	34	68	133	215	380	420	665	1,150	180			35	8,000 - 8,500
8,500 - 9,000	112	122	142	36	74	142	229	402	420	665	1,150	180			35	8,500 - 9,000
9,000 - 9,500	127	137	157	40	81	157	250	435	465	730	1,260	200				9,000 - 9,500
9,500 - 10,000	152	162	182	43	88	172	272	471	465	730	1,260	200				9,500 - 10,000
10,000 - 10,500	190	210	230	48	96	192	300	515	515	800	1,380	210				10,000 - 10,500
10,500 - 11,000		225	245		106	212	329	562	515	800	1,380	225				10,500 - 11,000
11,000 - 11,500		255	275		119	237	365	621	565	875	1,500	255				11,000 - 11,500
11,500 - 12,000		290	310		131	262	401	679	565	875	1,500	290				11,500 - 12,000
12,000 - 12,500		330	350		144	287	436	735	620	950	1,625	330				12,000 - 12,500
12,500 - 13,000		375	395		156	312	471	789	620	950	1,625	375				12,500 - 13,000
13,000 - 13,500		425	445		169	337	506	843	675	1,030	1,750	425				13,000 - 13,500
13,500 - 14,000		480	500		181	362	543	905	675	1,030	1,750	480				13,500 - 14,000
14,000 - 14,500		540	560		200	400	600	1,000	735	1,115	1,800	540				14,000 - 14,500
14,500 - 15,000									735	1,115	1,800					14,500 - 15,000

(1) 1947 Allowable Yardstick - assigned to all wells in a field discovered prior to January 1, 1965 upon expiration of discovery allowable provided no special allowable rule has been adopted.

(2) 1965 Allowable Yardstick - assigned to all wells in a field upon expiration of discovery allowable, if discovery of the field occurred on or after January 1, 1965.

(3) 1966 Offshore Allowable Yardstick - assigned to all offshore wells as defined in Railroad Commission Order No. 20-59,200, dated May 1, 1969 upon expiration of discovery allowable.

(4) Discovery Allowable -
Onshore - effective for 24 months from date of discovery or until the 11th well has been completed, whichever comes first.
Offshore- effective for 18 months from date of discovery or until the 6th well has been completed, whichever comes first.

(5) County Regular Allowable - for all oil well s carried in County Regular Fields.

(6) Marginal Allowable - may be assigned to any oil well on artificial lift after 30-day marginal test and the well's average daily production does not exceed a certain amount, according to its depth.

FIG. 7—TEXAS OIL WELL ALLOWABLES

cordance with the 1947 yardstick, which did not provide for 80 or 160-acre allowable. Upon expiration of the discovery allowable, the well's allowable will automatically be based on the 1965, 40-acre yardstick, unless special rules have been adopted before such time. Under this allowable the well completed between 9500 and 10,000 ft could produce 172 BOPD subject to the market demand factor. With a 50% market demand factor, the well's daily allowable would be one-half of 172 or 86 bbl.

Unless a special allowable provision is incorporated into field rules, the allowable will always be based on the 1965 yardstick. If field rules are adopted that provide for 80-acre spacing, the well completed between 9500 and 10,000 ft would receive 272 BOPD; 160-acre spacing, a 471 BOPD allowable—all subject to proration.

The allowable for oil wells is usually adopted in accordance with the 1965 yardstick when field rules are adopted. The Commission will assign a special allowable (may be higher or lower) if it is apparent from evidence presented at the hearing that the 1965 yardstick will not adequately protect or efficiently drain the reservoir.

To receive a marginal allowable a well must be on artificial lift and its average daily production for 30 consecutive days cannot exceed a certain amount, depending on its depth. The top daily marginal allowable of the well completed between 9500-10,000 ft is 35 bbl exempt from proration. With calendar-day testing and lease allowable in effect, there is no advantage to marginalizing a well just for the purpose of getting it exempt from proration. It is usually necessary, however, to marginalize all zones in a multiple completed well before downhole commingling of production can be obtained, and then the total production from all zones cannot exceed the top marginal allowable for the deeper zone. There is nothing in the rules to this effect however, and the Commission has been using it only as a guide for the past several years to administer downhole commingling permits.

The 1966 Offshore Yardstick Allowable became effective on January 1, 1966. This allowable was adopted to encourage offshore exploration. Notice that the offshore allowable is considerably higher than the 1965 onshore allowable.

The Lease Allowable System began on a temporary basis during the Suez Canal crisis in 1967 and was made permanent on May 1, 1968. This system permits the closing in of high gas-oil ratio and water-ratio wells and transferring their allowables to better wells on the lease. It is a method whereby an operator may produce the total allowable of a lease or unit from the better wells on that lease or unit. An operator may produce the entire lease's allowable from one well, except for wells located less than the minimum distance from the line which are permitted to produce only one (1) allowable—those at a minimum distance may produce only two (2) allowables. Lease allowable should not be confused with waterflood allowables, because under the lease allowable system it is necessary to test each well annually to determine its producing capability. This is not the case for wells in a secondary recovery project producing under a waterflood allowable.

Waterflood Allowable is granted to a project after response from injection has been received. In instances where only a portion of a project can show response from injection, a waterflood allowable will be granted to this area. The top allowable for a project is equal to the number of wells, producers and injection (assigned a proration unit), times the top well allowable subject to the market demand factor. An operator may request up to this amount as needed. There are times when it is necessary to produce a project in excess of top waterflood allowable to prevent oil being swept off the project or into trap areas where it cannot be recovered. This is referred to as "Capacity Allowable", granted initially for a field only after notice and hearing. Capacity allowable for other projects in the field may be granted administratively by the Commission.

Calendar Day Allowable Rate

On July 2, 1968, the Commission made effective an amendment to Statewide Rule 49 to permit the testing of each oil well in the State at the calendar day allowable rate during gas-oil ratio test or any such other test to demonstrate the ability of such well to produce oil. Calendar day allowable rate is the figure resulting by multiplying the schedule daily allowable by the Statewide market demand factor. For example, a well capable of producing only

60 BOPD in a field where the top allowable is 100 BOPD and the market demand is 50% would have the same allowable as a well capable of making 100 BOPD—both wells would have an allowable of 50 BOPD at a calendar rate (0.50 x 100). Prior to this amendment and without a hearing before the Commission, the 60 BOPD well would have received an allowable of 30 BOPD (0.50 x 60).

In the order adopting calendar day testing, the Commission advised operators to test their wells as near the scheduled allowable rate as possible because the variation in the allowable factor could cause the re-test of wells where the test rate for a well is less than the allowable rate. This situation is created when a well is tested at its calendar day rate with a low market demand factor; and, subsequently, the market demand factor increases. It is also important to know a well's producing capability for the possibility of (1) transferring allowable to it from another well, (2) assigning it tolerance acreage (discussed later), and (3) determining if lease allowable is necessary.

Gas Wells

There are two types of gas wells, associated and nonassociated. Associated gas wells are those that produce from an oil pool. These wells (commonly referred to as 49B gas wells) have their allowable determined by a formula set forth in the Statewide Rule 49. Nonassociated gas wells are those that produce from gas reservoirs. Their allowables are controlled by special field rules or by Statewide Rule 29. Statewide Rule 29 restricts the production from a gas well to 25% of the calculated open flow. The Commission will grant an operator permission to produce a well in excess of this amount if producing problems result (such as well loading up with fluid and dying) from having to produce a well at this low rate. Special rules are adopted for the purpose of gaining more than statewide allowable as well as assuring orderly development of the field. The allowable for gas wells in fields with special rules is determined by the Commission at the hearing. Several factors such as acre ft, surface acres, net pay, deliverability, demand, etc. are used by the Commission to fix the allowable.

Proration Schedules

The proration schedules are published by the Administrative Services Division from information furnished by the Proration analyst. These schedules are prepared and published monthly and semi-annually. Because these publications contain information about fields and the wells in them, they are most essential in proration work.

Figure 8 is a sample page of the oil proration schedule. Time will be well spent to consider what it says. On Line One, the underscored numeral *8* indicates the Commission District. The number *5555* is the Commission's data processing code for the field. *Hill Top* is the name of the field and *San Andres* is the name of the formation from which the wells produce. *Midland* is the name of the county in which the field is located. On Line Three, the *1-1-66* is the date the field was discovered, *39.0* is the gravity of the oil, *2000:1* is the gas-oil ratio limit, *4000* is the depth of the top of pay in the discovery well. *Top allow 93* is the highest allowable a well located on a standard proration unit will be assigned in this field. On Line Four, *Spacing 660-1320* means that a well in this field can be drilled no closer than 660 ft from the lease line and no closer than 1320 ft from the nearest well on the same lease without a special permit. *40 Acre Units* means that a proration unit must contain 40 acres. *20 Acre Tolerance Last Well* means that after drilling the last well on a lease and there remains less than a standard unit, this amount of acreage may be assigned to one well or it may be divided among several wells on the lease. Tolerance acreage will be discussed more fully a bit later. *Diagonal Limit 2100* means that the proration unit cannot have its two farthermost points more than 2100 ft apart. In case of long, narrow tracts, an exception to this rule may be received. —Line 5: *Casing 700 Ft* means that at least 700 ft of surface casing must be set in the well to protect fresh water sands. —Line 6: Is the allocation formula—2/3 of the allowable is based on acres and 1/3 is based on the well. In this case, the well would receive 62 bbl for 40 acres and 31 bbl for the well. —Line 7—*Acreage Factor 1.550* is the number of bbl of oil that will be allowed for each acre in the proration unit. —Lines 9 and 10 carry headings of the columns for *Well Nos., Depth (top of pay), POTE,* num-

ber of bbl the well was capable of making the last potential test filed with the Railroad Commission; *Acres* is the number of acres in the proration unit assigned to the well, and *Gas Limit*—the total volume of gas in MCF which may be produced with the allowable assigned to the well. —Line 12 is the name of the Operator and Company. —Line 13 is accounting code number assigned by the Railroad Commission and the name of the lease. On Line 14 is the Well No., depth to top of pay, potential, number of acres assigned to the well, GOR, Allowable, and Gas Limit. On line 16, the star by the value in the allowable column means the well in penalized because of its high gas-oil ratio (notice the 2800 in the GOR column). On Line 17 notice that this well has 60 acres assigned to it, the 20 tolerance acres have been assigned to this well; therefore, its allowable is raised to 124 (60 x 1.550 = 93; 93 + 31 = 124) and the gas limit is raised to 248 M (124 x 2000). On line 18 the symbol by the allowable indicates this well would not make its assigned allowable and the proration analyst lowered it. —Line 19:21 M indicates the well is marginal, 50X is the dialy gas limit for a marginal well (25 marginal top x 2000). —Line 20: 24# means this is a limited capacity well (notice that its capacity is lower than the top marginal allowable for a well at this depth); because it is a flowing well, it cannot be marginalized. Lines 22, 23, and 24 are field totals.

8 5555 Hill Top (San Andres) Midland County

DISC. 1-1-66, GRAV 39.0, RATIO 2000-1, DEPTH 4050, TOP ALLOW 93
SPACING 660-1320, 40AC. UNITS 20 AC. TOL. LAST WELL DIAG. LIMIT 2100
CASING 700 FT
ALLOCATION 2/3 ACREAGE - 1/3 PER WELL
FACTOR , ACREAGE 1.550

WELL #	DEPTH	POTE	ACRES	GOR	OIL ALLOW	GAS LIMIT
MOBIL OIL CORPORATION						
00100 HILL, JOE						
1	4050	500	40	1200	93	186
2	4010	350	40	900	93	186
3	4116	290	40	2800	66 *	186
4	4090	410	60	770	124	248
5	4000	55	40	1150	55 @	186
6	4025	21	40	700	21 M	50 X
7	4135	24	40	1930	24 #	186
FIELD TOTALS			PRORATED	6 WELLS	455	1178
			EXEMPT	1 WELL	21	50
			ALL	7 WELLS	476	1228

FIG. 8—TEXAS OIL
PRORATION SCHEDULE (SAMPLE)

Tolerance Acreage

When special field rules for a field are adopted and acreage is made a part of the allocation formula, a definite amount of acreage must be assigned to each well. This acreage is called a "standard proration unit." In case the acreage in a lease cannot be divided equally into standard proration units, a provision called "toler ance acreage" is included in all special field rules with few exceptions. The exceptions would be in field rules that provide for optional proration units; i.e., 10 or 20 acres and 20 or 40 acres.

The "tolerance acreage" provision is normally included in special field rules for both oil and gas wells and it works as follows: If the standard proration unit contained in a set of field rules for oil is 40 acres, the tolerance acreage provision would probably be 20 acres. Generally the tolerance acreage equals one-half the standard proration unit for an oil well, but never exceeds 40 acres. The operator of a 140-acre lease in this field could drill three wells on standard 40-acre units leaving 20 acres unassigned. This 20 acres could be assigned to any one of the three wells on the lease or it could be divided among all three.

The operator of a 145-acre lease could drill three wells on standard units and one on a 25-acre unit, or he could assign 20 of the 25 acres to other wells and have five acres remaining for which he would receive no credit.

Tolerance acreage can be assigned to oil wells before a lease has been drilled to its final density by filing affidavits of no further drilling. If additional drilling is done at a later data, the oil received through tolerance acreage will be treated as over production and have to be made up.

Tolerance acreage for gas wells producing from non-associated gas reservoirs where special field rules have been adopted is usually based on 10% of the acreage in a standard unit. This amount of acreage may be assigned to each gas well on a lease as it is drilled and not have to wait until the last well has been completed. Thus, if the field rules call for a standard unit of 640 acres, up to 64 tolerance acres could be assigned to the well.

To prevent waste and the confiscation of property, the Commission may, after notice and hearing, permit the assignment of tolerance acreage in excess of that mentioned above.

Market Demand Factor

The "Market Demand Factor" is a percentage of the allowables assigned to oil wells other than those exempt from proration; i.e., marginal, discovery, county regular, etc. This factor is announced monthly by the Railroad Com-

mission after the Statewide market proration hearing is held before the Commissioners. This factor is set in accordance with the nominations to purchase crude oil in the State by prin cipal buyers. This particular method has been used since January 1963, when it replaced the old shut-down-day system.

NEW MEXICO—RULES AND REGULATIONS

Oil and gas wells in the State of New Mexico are either drilled under the provisions of Rule 104 of the General Rules of Statewide application or of special pool rules. Rule 104 is too lengthy to repeat verbatim or explain fully in this paper. Generally, however, it provides that oil wells will be located on a 40-acre tract of land substantially in form of a square being a lot or a quarter-quarter subdivision of a section. The well must be located 330 ft from the outer boundary of such tract and not closer than 330 ft from another well on the same tract producing from the same zone. Rule 104 also provides that, excepting tracts committed to secondary recovery projects, not more than four wells can be drilled on a 40-acre tract and only one allowable will be assigned. On 40-acre tracts committed to a secondary recovery project, as many as nine wells could be drilled, with the allowable restricted to the project allowable.

Gas well density varies from 160 to 320 acres and from 660 ft to 790 ft from the outer boundaries of the proration unit depending on depth to be drilled and the county where located. Variations are too numerous to mention here, thus it is advisable to consult Rule 104.

Special pool rules are adopted after notice and hearing by the Commission when it is apparent that the provisions of Rule 104 are not adequate. These rules may provide for 80 or 160-acre proration units for oil wells instead of the 40-acre statewide spacing unit. Proration units containing 640 acres might be adopted for gas wells. There is no provision for tolerance acreage in New Mexico field rules for either oil or gas wells. Any well drilled a distance of one mile or more from the outer boundary of any defined pool producing from the same formation to which the well is projected will be considered a wildcat by the Commission and placed in a new pool. After further development, the pools may be consolidated if conditions warrant.

Any well which is not a wildcat as described above will be classified as a development well for the nearest pool which has produced oil or gas from the formation to which the well is projected. Said well will be drilled, spaced, operated, and produced in accordance with the rules in effect for such nearest pool. After the well is completed the field will be expanded to include it. If the operator feels that he has a discovery well he may request a hearing before the Commission to present evidence for discovery allowable and new field designation.

Most all applications of a routine nature are handled at the district level. All those requiring notice or notice and hearing are processed by the main office in Santa Fe. This is unlike Texas where almost all applications are acted upon in Austin.

New Mexico recently adopted the "Market Demand Factor" method for determining the need of oil from the State. Their system works much the same as that used by Texas. The Commission meets monthly and reviews the allowable situation. If it appears that the market demand factor should be changed, a statewide hearing will be called and a new factor set for the next two months.

Allowable, Gas Wells

The New Mexico Oil Conservation Commission will fix the allowable for gas wells in a designated gas pool when necessary to prevent waste. This will be done after notice and hearing where the Commission will consider nominations of gatherers and other relevant data. Production will be allocated among the gas wells in accordance with pool rules and delivered to gas transportation facilities as required by their demands.

Allowable, Oil Wells

Oil wells are assigned allowables based on depth and acreage. Unless special pool rules have been adopted, the allowable for any oil well will be based on depth and 40 acres. Figure 9 is a chart showing the various allowables. This table is used to determine the allowable of an oil well in New Mexico just the same as the 1965 Yardstick is used in Texas. By comparing Fig. 9 and Fig, 7 it will be found that in most all cases the New Mexico oil wells re-

ceive higher allowables (no criticism intended). All allowables shown on Fig. 9 are subject to the market demand factor.

40 AC.	80 AC.	160 AC.	DEPTH - FT.
80	160	---	0 - 4,999
107	187	347	5,000 - 5,999
142	222	382	6,000 - 6,999
187	267	427	7,000 - 7,999
230	310	470	8,000 - 8,999
275	355	515	9,000 - 9,999
320	400	560	10,000 - 10,999
365	445	605	11,000 - 11,999
410	490	650	12,000 - 12,999
455	535	695	13,000 - 13,999
500	580	740	14,000 - 14,999
545	625	785	15,000 - 15,999
590	670	830	16,000 - 16,999
635	715	875	17,000 - 17,999

These allowables are subject to the market demand percentage factor and apply to all wells not covered by special pool rules.

In addition to this allowable, the discovery well will receive a bonus allowable of 10 barrels of oil per ft of depth drilled if deepest in county. Otherwise five barrels per ft of depth drilled. The total discovery allowable shall be produced over a 2-year period beginning at a time authorized by the Commission.

FIG. 9—NEW MEXICO DEPTH BRACKET ALLOWABLE

Discovery Allowable

In addition to the normally assigned allowable, a discovery allowable may be assigned to a well classified by the Commission as a discovery well in a new pool. This bonus will be assigned to one well only, and it will be in the amount of *5 bbl of oil per ft of depth* from the surface of the ground to the top of the perforations or the depth of the casing shoe, whichever is higher. In counties where there is no other production or in counties where this is the deepest production, this bonus allowable will be 10 bbl per foot of depth. The total discovery allowable shall be produced over a two-year period beginning at a time authorized by the Commission. The well's daily allowable shall not exceed the top unit allowable for the pool plus the total pool discovery allowable divided by the number of days in two years. Thus, a 10,000-ft discovery well in a county with no other production would receive a bonus of 100,000 bbl of oil to be produced at a rate of 137 BPD for a two-year period. The well's total daily allowable for the first two years in the absence of any special rules would be 320 BPD plus discovery bonus.

Figure 10 is a portion of a New Mexico proration schedule. This figure does not show each and every entry likely to be made on this schedule; however, the more important ones are given.

1. VACUUM ABO NORTH
2. (80 Acre Spacing)
3. TOP ALLOWABLE 355 GOR LIMIT 2000
4. TOP CSNG. HEAD GAS LIMIT 710 MCF
5. MOBIL OIL CORPORATION
6. BRIDGES STATE
7. " (150) 118 F 26-17-34 90 1637
8. " (40) 119 F 24-17-34 40 **6045
9. " (300) 131 B 10-17-34 71 *10,000
10. " (400) 150 N 11-17-34 355 TSTM

FIG. 10—NEW MEXICO OIL PRORATION SCHEDULE (SAMPLE)

Line 1: *Vacuum, North* is the name of the pool and *Abo* is the producing formation.

Line 2: *80 Acre Spacing* indicates that each well must be located on a proration unit containing 80 acres.

Line 3: *Top Allowable 355* means that a well in this pool located on an 80-acre proration unit will receive as its allowable 355 BOPD subject to the market demand factor.

Line 4: *Top Casinghead Gas Limit 710 MCF* is the most gas any oil well will be allowed to produce each day. This figure actually controls the allowable of wells with gas-oil ratios in excess of 2000:1. It works as follows: if a well has a gas-oil ratio of 5000:1 the top

allowable of this well would be 142 BOPD, arrived at by dividing the daily gas limit by the gas-oil ratio (710,000 ÷ 5000).

Line 5: *Mobil Oil Corporation* is the name of the operator.

Line 6: *Bridges State* is the name of the lease.

Line 7: *(150)* is the number of bbl of oil the well made on the last test; *118* is the well number; *F* is the 40-acre subdivision of the section on which the well is located; *26-17-34* is the Section, Township and Range; *90* is the well's allowable—in this case probably all it will make; and *1637* is the gas-oil ratio of the well as determined by the last test.

Line 8: ***6045* means the well has a high gas-oil ratio, but it is not penalized because its capacity is too low.

Line 9: **10,000* means the well has a high gas-oil ratio and has a penalized allowable because of it. The well made 300 bbl on the last test, but has an allowable of only 71 bbl.

Line 10: *355* shows the well to be a top allowable well; *TSTM* means the gas-oil ratio was too small to measure.

CONCLUSION

The primary responsibilities of proration personnel have changed recently due to the energy crisis and environmental problems. Previously, a paramount duty of these persons was to maximize legal allowable for their company's wells because in the past many wells had the capacity to produce in excess of their allowable. Due to reduced well capabilities and high market demand factors this situation is now reversed, which means that proration specialists find it more difficult to come up with obvious income-generating ideas. Perhaps what should be looked for more then, are money-saving methods and opportunities as well as those that increase revenue. After all, there is really no difference.

Some things you might want to consider that could prove fruitful to your company are:

1. Downhole commingling of multiple completed wells with low producing ability
2. Lease consolidation where base lease was subdivided into several farms
3. Net gas-oil ratio
4. Lease and waterflood allowables.

Just as the role of the oil company employee working in proration has changed, so has the role of the regulatory agency employee. His concern is no longer one of overproduction, but rather the prevention of waste of hydrocarbons. This is evidenced by the recent no-flare orders and lowering the market demand factor in certain areas to prevent gas flaring. Also, regulatory agency employees are responsible for administering some of the new pollution control laws.

In this type of work, one is always faced with new challenges due to the changing conditions. This is what makes the work interesting and exciting. Let us hope that we are able to meet and solve the problem of the growing energy crisis and protection of our environment.

ACKNOWLEDGMENTS

The author wishes to thank the Management of Mobil Oil Corporation for allowing this paper to be published. The author also wishes to express his appreciation to the following for their contribution to this work:

Mr. A. L. Porter, Jr., Secretary-Director, New Mexico Oil Conservation Commission (consultation and written material).

Mr. James C. Bouldin, Director of Proration & Production, Texas Railroad Commission (consultation).

Mr. Bob Harris, Director of Research and Inspection, Texas Railroad Commission (consultation).