

CONSERVATION OF OIL AND GAS

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ANY discussion of the problem of conservation of oil and gas must necessarily be predicated on the hypothesis that conservation per se is important to the welfare of the country. This hypothesis, however, has been questioned. Despite substantial production and consumption during the past twenty-five years the estimated reserves of oil and gas in this country have not materially changed owing to new discoveries or further information regarding the size of known producing formations. Some persons anticipate that the curves of discovery and production will continue to coincide in the indefinite future and urge that conservation measures which add to the cost of production are not worthwhile. Other opponents of conservation point to the experiments with oil shales and with hydrogenation of coal and suggest that through such processes we are assured of an ample supply of lubricants and liquid and gaseous energy sources for the indefinite future. Those hopeful of early utilization of atomic energy for commercial purposes may also argue that conservation of oil and gas is unnecessary and uneconomic.

Whatever one's hopes or expectations may be as to any of these matters, it must still be recognized that the national welfare is subjected to great risks by failure to make maximum use of currently available reserves of oil and gas by appropriate conservation measures. This paper proceeds on the assumption that we can ill afford the risks and that conservation per se is of real importance to the welfare of the country.

Conservation is, of course, a relative matter. One method of conserving a natural resource is by complete or partial prohibition of production or consumption. The policy of setting aside petroleum reserves for the Navy was based on this theory. In a less restrictive manner, oil and gas resources may be conserved by prohibition of their use for particular purposes — for example, for industrial or domestic heating or as energy sources where coal, in much more abundant supply, may be utilized for the same purpose.

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Or petroleum products may be conserved by preventing their employment in nonefficient processes or inferior uses. Thus the ends of conservation would be served by forbidding the use of gasoline in automotive engines with an efficiency of less than 30 miles per gallon or by prohibiting the use of natural gas or oil in the manufacture of carbon black. The writer is not ready to advocate such far-reaching conservation measures nor does the present state of public opinion suggest any possibility of success in the institution of such measures.

The purpose of this paper is more limited in scope. It is to explore the possibilities of: attaining maximum production from known fields by more efficient utilization of reservoir energy¹ and by early institution of secondary recovery operations;² requiring maximum possible recovery of liquid hydrocarbons from natural gas and casinghead gas and from distillate fields,³ with reinjection⁴ or sale of the dry gas;⁵ and limiting certain inefficient and inferior uses of natural gas or oil, particularly in the manufacture of carbon black. A discussion of the multifarious character of regulation of the drilling and production process by state regulatory agencies is not within the scope of this paper.⁶

I.

The impact of the rule of capture upon the fact of divided interests in minerals presents the major obstacle to scientific development of petroleum-producing formations.

¹ The sources of natural energy, one or more of which are present in all commercially productive oil reservoirs, are:

(1) The expansion, as a result of pressure reduction, either of gas which has come out of solution from the reservoir oil or of free gas initially present in the reservoir.

(2) Edge or bottom water encroachment, also a result of reduction of pressure.

(3) Gravitational force.

(4) Expansion of the reservoir oil itself as pressure is released. "Either gas expansion or water encroachment provides the principal energy for most petroleum reservoirs." INTERSTATE OIL COMPACT COMM'N, OIL AND GAS PRODUCTION 36 (1951).

² Secondary recovery operations involve the supplementing of natural energy by injection under pressure of either gas or water into the reservoir.

³ The distillate or condensate type of reservoir is that in which by reason of high subsurface pressures and temperature some of the heavier hydrocarbons are originally dissolved in gas.

⁴ Reinjection involves the return of gas to the producing horizon as a means of maintaining reservoir pressure.

⁵ Gas from which liquefiable hydrocarbons have been removed.

⁶ In the past two decades, a number of useful new regulatory measures have been enacted. See, e.g., ARIZ. CODE ANN. c. 11, §§ 1701-28 (Supp. 1951); COLO. STAT.

Normally, ownership of or the right to produce minerals is an incident of ownership of the land overlying the producing formation. To a limited extent the right to produce minerals is in the Federal Government or one of the states, but this is usually because of ownership of the overlying land.⁷ Occasionally certain rights to minerals were reserved (by the state or federal government) at the time of severance of the land from the public domain,⁸ but with the exception of minerally classified lands in Texas,⁹ this represents a relatively small portion of presently or potentially productive mineral deposits.¹⁰

With the division of surface ownership into small parcels, ranging down in size to city lots, the right to produce the minerals from a formation underlying the surface is correspondingly divided. A further complication arises from the fact that in some states the minerals are considered capable of corporeal ownership separate and apart from ownership of the overlying surface,¹¹ and in others an interest in the nature of a *profit à prendre*¹²

ANN. C. 118, §§ 68(1)-(16) (Supp. 1951); Wash. Laws 1951, c. 146; WYO. COMP. STAT. ANN. §§ 57-1108 — 57-1124 (Supp. 1951). The producing industry has generally been cooperative in the drafting and enforcement of such regulations.

⁷ *But cf.* United States v. California, 332 U.S. 19 (1947); United States v. Louisiana, 339 U.S. 699 (1950); United States v. Texas, 339 U.S. 707 (1950), *rehearing denied*, 340 U.S. 848 (1951). These "Tidelands" cases held that the right to produce minerals from the continental shelf was in the Federal Government; the question of title to or ownership of the land under the water was technically not decided.

⁸ See, e.g., N.D. REV. CODE c. 38-0901 (1943).

⁹ See Walker, *The Texas Relinquishment Act* in SOUTHWESTERN LEGAL FOUNDATION, FIRST ANNUAL INSTITUTE ON OIL AND GAS LAW 245 (1949).

¹⁰ In distinct contrast is the situation in the newly discovered fields of western Canada. With relatively minor exceptions, minerals were reserved by the sovereign at the time of the grant of lands and hence development of the mineral resources in accordance with sound engineering practices presents few of the problems common to our producing states. The situation in Texas could have been similarly simple owing to the fact that minerals were reserved in Spanish, Mexican and early Texas grants. Primarily as a result of a long struggle over rights to a salt deposit, the Texas Constitution adopted in 1866 released to the owner of the surface the minerals in all lands theretofore granted by the sovereign. This provision was carried forward in the Constitutions of 1869 and 1876, and a similar provision appears in the Revised Statutes of 1895. The history of this salt deposit and of the action of the Constitutional Convention of 1866 is charmingly told in HAWKINS, *EL SAL DEL REY* (1947). Tax and fiscal problems of the State of Texas would be far simpler today had this salt deposit never existed, for it is probable that the state would be exclusively entitled to the vast mineral resources underlying its soil.

¹¹ Stephens County v. Mid-Kansas Oil & Gas Co., 113 Tex. 160, 254 S.W. 290 (1923).

¹² A *profit à prendre* is a privilege to go upon servient land and to acquire through severance ownership of some of the physical substance of the servient land. The

may be created in the minerals.¹³ As a consequence, mineral deeds (or reservations) have created divided interests in minerals, and the number of owners of mineral interests in relatively small tracts is often great. The interest of a particular mineral owner may be represented by a fraction with a denominator of from two to five or more figures.¹⁴

Basically the rule of capture, which applies in the absence of legislation, provides that each mineral owner may drill on his land where and in such density as he may choose. However small the tract, or wherever located on the producing structure, the mineral owner (or his lessee) has a right to produce the minerals underlying the land in which his interest lies.¹⁵ Applying this common law view, it was held in one early case that an injunction might not issue to prevent an owner from allowing his gas well to flow wide open although he was not using the gas and was draining gas from under the land of the plaintiffs upon which there were producing wells in the same formation.¹⁶ This was an extreme application of the rule, and it is doubtful that any modern court would reach the same result, even in the absence of legislative action on the subject of conservation.¹⁷ Examples of exploitation at the expense of neighbors might be cited by the score.

significant differences between easements and profits in modern law are so few that the *Restatement of Property* uses the word "easement" for both varieties of interests in the land of another. RESTATEMENT, PROPERTY § 450, Special Note (1944).

¹³ *Dabney-Johnston Oil Corp. v. Walden*, 4 Cal.2d 637, 52 P.2d 237 (1935).

¹⁴ The distinction between royalty and mineral owners should be noted. A royalty owner has an incorporeal interest in land of the character of a rent. See Summers, *Transfers of Oil and Gas Rents and Royalties*, 10 TEXAS L. REV. 1, 2 (1931). He normally has no operating or leasing rights and no power of veto over a program for the development of a tract. See Jones, *Non-Participating Royalty*, 26 TEXAS L. REV. 569 (1948).

Some doubt has been cast upon the validity of this generalization, however, by such cases as *Schlittler v. Smith*, 128 Tex. 628, 101 S.W.2d 543 (1937); *Brown v. Smith*, 141 Tex. 425, 174 S.W.2d 43 (1943); *Elliff v. Texon Drilling Co.*, 146 Tex. 575, 210 S.W.2d 558 (1948); and *Hunt v. McWilliams*, 218 Ark. 922, 240 S.W.2d 865 (1950), which suggest that the royalty owner is entitled to some degree of protection under a standard of "fair dealing." The nature of the protection afforded a royalty owner has not been delimited by the courts, and the uncertainty as to its character has undoubtedly had some deterrent effect upon the accomplishment of voluntary programs for cooperative development of producing formations.

¹⁵ *E.g.*, *Barnard v. Monongahela Natural Gas Co.*, 216 Pa. 362, 65 Atl. 801 (1907).

¹⁶ *Hague v. Wheeler*, 157 Pa. 324, 27 Atl. 714 (1893).

¹⁷ See *Elliff v. Texon Drilling Co.*, 146 Tex. 575, 210 S.W.2d 558 (1948), 62 HARV. L. REV. 146 (plaintiff awarded damages for loss caused by defendant's negligent waste in extracting oil from common pool).

In the Ranger field in Texas, after a producing well had been brought in on a small tract surrounded by the holdings of another operator, the latter erected wells around the small tract almost in the nature of fence-posts, thereby draining the small tract and precluding profitable production from it.¹⁸

The rule of capture made it economically imperative that each mineral owner drill his land and produce at as rapid a pace as possible, for otherwise his land would be drained of oil and gas by wells on adjacent properties. Furthermore, the implied covenant in oil and gas leases that the lessee would protect the leased premises from drainage¹⁹ required the drilling of offset wells²⁰ by lessees when wells off the leased premises began to drain the oil or gas. The result was profligate drilling and tremendous physical waste of oil which in many instances was produced even though there was no market available and stored on the surface where it was subject to loss by evaporation, fire and seepage. Frequently this was accompanied by dissipation of native reservoir energy, production with excessive gas-oil ratios, and flaring of casinghead gas.²¹

II.

Over a period of years there has been a legislative response to this situation in the form of regulatory measures governing the production of oil and gas. The most important of such measures have been prorationing, well-spacing, and compulsory pooling and unitization. In addition there are numerous other statutory and regulatory measures designed to prevent waste, some of which will be described below.

A. Prorationing

In times of high demand the problem of prorationing is relatively simple. State regulatory agencies with power to restrict production to prevent waste and protect correlative property rights are

¹⁸ Still another example is graphically related in RISTER, OIL! TITAN OF THE SOUTHWEST 92 (1949). A company owning a pipe line and a refinery had only a small lease of ten acres in an Oklahoma pool. Running all of its production from the ten acres, the company drained not only its own oil but that under its neighbor's land as well.

¹⁹ See MERRILL, COVENANTS IMPLIED IN OIL AND GAS LEASES c. 5 (2d ed. 1940).

²⁰ Those wells drilled near the boundary of a tract and so located as to counteract the drainage of oil from under the tract by wells on adjacent property.

²¹ The term "casinghead" gas refers to gas produced from an oil well as distinguished from gas produced from a gas well.

then concerned only with limiting production from particular pools and wells to the maximum efficient recovery (MER).²² When, however, available productive capacity is such that production at the MER for all wells will glut the market and result in waste by reason of excess surface storage, the problem of limiting production becomes more complex.

In all major producing states except California²³ there is some mechanism available whereby a regulatory agency of the state exercises power to prorate production. The mechanics of the process are relatively simple. The initial step is to make a determination of what the whole state should produce. A formula developed by the Federal Oil Conservation Board during the Hoover administration is followed. This involves a technique of forecasting consumption during short periods of time followed by an analysis of the amount of crude oil needed to satisfy this demand. This is broken down among the producing states by the Bureau of Mines²⁴ by tracing the past history of crude oil from

²² The MER is the maximum efficient recovery of oil from a well consistent with maximum ultimate recovery from the producing structure. For example, in a water drive field, that is, one in which water underlying the oil in the producing structure provides the energy for primary production by hydrostatic pressure, the rate of withdrawals of oil may be limited to about 3 to 5 percent per year of the ultimate yield so as to coincide with the rate of movement of water into the structure. If this were not done, pressure would drop, gas would come out of solution in the oil rendering it more viscous and in part nonrecoverable, and water would "finger" through the producing structure segregating pockets of unrecoverable oil. See *Hearings before Committee on Interstate and Foreign Commerce on H.R. 7372*, 76th Cong., 3d Sess. 560 (1939); FANNING, *OUR OIL RESOURCES* 129 (2d ed. 1950).

²³ To a limited extent, prorationing has been accomplished by voluntary agreement in California through the California Conservation Committee of producers. The mechanics of the voluntary system employed were explained in the Cole Committee hearings in 1940. *Hearings, supra* note 22, at 694, 732, 1707 (1940). Two acts have passed the California legislature providing for state regulation, but in both instances (in May, 1932, and most recently in November, 1939) the bills have been repealed by referendum before becoming effective. On May 12, 1950, an antitrust suit was filed by the Department of Justice in the federal district court in Los Angeles naming as defendants seven major producing companies in California, seeking dissolution of the Conservation Committee and an injunction preventing any voluntary conservation practices not authorized by state law. *N.Y. Times*, May 13, 1950, p. 1, col. 2.

²⁴ In addition to this forecasting function of the Bureau, further activities relating to the oil industry include the conduct of research and development programs to furnish the scientific, engineering and economic information required for the production of synthetic liquid and gaseous fuels from reserves of oil shale and coal, and research designed to improve current production methods and to increase the efficient utilization of oil produced. Other related activities of the Department of the Interior include the provision of basic geological data for parts of the country that offer

producing states to refineries and finally to consumers. The state prorationing authorities, guided by the estimates furnished by the Bureau of Mines,²⁵ fix the allowables — the amount which may be produced per day from the various fields, pools and wells in each state — in order that the production from the state shall not exceed a reasonable estimate of market demand.²⁶

Historically, one of the major obstacles to successful conservation through prorationing has been lack of cooperation among the several states in the fixing of allowables. This has resulted in considerable waste of oil and gas and of reservoir energy in such states as Kansas²⁷ and Illinois.²⁸ The inadequacy of the market for the oil produced in some states has resulted in wasteful surface storage and the premature abandonment of stripper wells²⁹ with

promise of additional discoveries of oil and gas, study of oil shale deposits by the Geological Survey, the giving of advice and assistance to federal agencies having responsibilities with respect to oil or gas, or affected by petroleum supply, and to the petroleum and allied industries, and the supervision of the administration of the Connally Hot Oil Act by the Oil and Gas Division. See ANN. REP. SEC'Y INTERIOR X, 150, 151, 171, 172, 215, 217 (1949-1950).

²⁵ The estimates made by the Bureau of Mines are not binding upon the state prorationing agencies, though typically they are followed. If a state produces in excess of the Bureau's estimates, in time this will be reflected in the estimates. The Interstate Oil Compact Commission, of which some twenty-two of the producing states are members, has never overtly exercised any control over the prorationing process. The avowed sole purpose of the Commission is "to conduct an educational program for the benefit of conservation in general and for the purpose of coordinating the conservation laws of the various states." Testimony of Hiram M. Dow, member of the Commission, *Hearings, supra* note 22, at 1528 (1940). It seems clear, however, that informal discussion in the Commission may lead to unified action by the several regulatory agencies. See, e.g., the informal concerted action in closing down wells in 1939 which followed an announced price decrease for oil by a major oil company. *Id.* at 1562.

²⁶ See, e.g., the authority granted the Texas Railroad Commission. TEX. REV. CIV. STAT. ANN. art. 6049c, § 5 (1949). This authority is common to the several state regulatory agencies with the exceptions of: California, which lacks statutory prorationing procedures; Mississippi, where market demand may not be a basis of prorationing, MISS. CODE ANN. § 6132-01 (Supp. 1950); Illinois, where production may not be limited to prevent or control economic waste or on the basis of market demand, ILL. ANN. STAT. c. 104, § 86 (Supp. 1951); and Colorado and Wyoming, where the Commission is prohibited from restricting production of any pool or well to an amount less than can be produced without waste in accordance with sound engineering practices, COLO. STAT. ANN. c. 118, § 68(14) (Supp. 1951); WYO. COMP. STAT. ANN. § 57-1124 (Cum. Supp. 1951).

The constitutionality of prorationing has been sustained on numerous occasions. *E.g.*, *Champlin Refining Co. v. Corporation Comm'n of Okla.*, 286 U.S. 210 (1932).

²⁷ AMERICAN BAR ASS'N, CONSERVATION OF OIL AND GAS 138 *et seq.* (1949).

²⁸ *Id.* at 92 *et seq.*

²⁹ This term refers to pumping wells capable of only small production which are "stripping" the producing formation of the last recoverable oil.

consequent loss of recoverable oil, and has served as an obstacle to the institution of water flooding and other secondary recovery methods. Increased demand during and after World War II has mitigated the severity of certain of these problems, but the problem of ratable taking among the states continues as a major concern of the producing states. Although within the individual states there is ample authority to require ratable taking among producing pools, and, subject to certain limitations, within each pool, there is no method of assuring ratable taking as among the several producing states. The Interstate Oil Compact Commission has no compulsive power. It is frequently stated that the State of Texas, which has a strong regulatory agency, bears the brunt of the impact of fluctuating market demand in that it carries the major burden of reducing allowables when there is a decline of demand. So long as the Texas Railroad Commission assumes this burden, the conservation problems which plagued Kansas³⁰ in the middle thirties will not recur in Kansas or in other producing states, at least in the same malignant form. There are, however, economic pressures within the state of Texas which make it politically difficult to continue this policy in times of declining market demand, for example, the fact that state revenues are in a large measure dependent upon oil production. A return of the wells in Iran to major production coupled with increases in production from other areas of the Middle East could make the problem critical.

One of the important consequences of prorationing has been the stabilization of the price of petroleum products. The estimate of market demand for oil as made by the Bureau of Mines or a state commission is necessarily founded on assumed prices for fuel oil and other products of crude oil. It does not take into account the potential demand for the products at lower prices. With a decline in prices of petroleum products, a number of users of coal or other energy sources would find it economically desirable to shift to oil. Because of the difficulty and complexity of the conversion process, however, the response of demand to price changes will be slow, although of course the degree of inelasticity may vary among the several petroleum products. With demand inelastic, fluctuations in the production of oil will have a significant effect on prices, as indicated by the major decline in prices resulting from the influx of oil into the market after the discovery

³⁰ See note 27 *supra*.

of the East Texas field. To the extent that it is based on estimates of market demand, the prorationing process provides insurance against reduction of prices by making available only such quantities of petroleum products as will under anticipated market conditions maintain given prices.

Desire for the achievement of stable prices was admittedly a major factor in the general support given prorationing by the oil industry initially and through the years, and the same consideration has not been far removed from the minds of members of the regulatory commissions.³¹ Nevertheless, prorationing is also one of the most important recent developments in conservation. Where previous measures controlled waste in particular wells, prorationing recognizes the need for producing from a field as a unit so as to use the energy of the reservoir efficiently to achieve maximum production.

Even as a price-fixing measure, prorationing serves the ends of conservation. A fair and steady price for petroleum products is essential to the continuance of wildcatting and exploration.³² A steady, reasonably high price discourages the abandonment of stripper wells, provides an incentive to the achievement of maximum ultimate recovery by secondary recovery methods and recycling,³³ and tends to encourage the use of competing energy sources in more abundant supply, such as coal, thereby conserving available reserves of oil and gas.

B. Well-Spacing

Hand in glove with prorationing go well-spacing regulations. These are now a general feature of administrative regulation.

³¹ Note, *e.g.*, the concerted action by regulatory commissions in closing down production in 1939 immediately upon the announcement of a price decrease by a major company. See note 25 *supra*. Taking the position that the primary purpose of prorationing is price-fixing and the stabilization of the industry are ROSTOW, A NATIONAL POLICY FOR THE OIL INDUSTRY (1948); WATKINS, OIL: STABILIZATION OR CONSERVATION? (1937); Davis and Willbern, *Administrative Control of Oil Production in Texas*, 22 TEXAS L. REV. 149 (1944). Strongly opposed are the views of other writers. See Hardwicke, *Market Demand as a Factor in the Conservation of Oil* in SOUTHWESTERN LEGAL FOUNDATION, FIRST ANNUAL INSTITUTE ON OIL AND GAS LAW 149 (1949).

³² See Ely, *The National Government and the Conservation of Oil and Gas* in AMERICAN BAR ASS'N, CONSERVATION OF OIL AND GAS 599, 676 (1949).

³³ The terms cycling and recycling are used synonymously to describe a form of pressure maintenance applied to distillate reservoirs of gas. After liquid hydrocarbons are removed from the gas produced, the residue or dry gas is compressed and injected through other wells into the same reservoir from which the gas was produced.

Under the applicable statutes and regulations in Texas, for example, permits for the drilling of wells must be obtained from the Railroad Commission. In the issuance of permits, the Commission applies Rule 37³⁴ on the location of wells, which in effect allows one well for every twenty acres. After a hearing, however, the Commission may make special rules applicable to a particular area, and it has established spacing patterns applicable to certain of the fields in Texas allowing one well for as few as ten or as many as forty or more acres. The spacing pattern thus may vary in the several fields on the basis of the time of application of the rule to the field, local geological conditions and other factors.

This limitation of the power of the landowner to drill wells at such locations as he may choose is extremely important because dense spacing dissipates reservoir energy, occasions some wastage of oil or gas while the wells are being cleaned out,³⁵ increases the hazards of fire or other accidents which cause loss of minerals or damage to the producing structure, and results in uneconomic use of materials and labor in the drilling of unnecessary wells. However, well-spacing as a conservation measure is in turn subject to certain limitations deriving in part from restrictions on the power of the regulatory agencies and in part from policies adopted by such agencies.

The most important of these limitations is illustrated by the "separate tract" rule developed by the Texas court. In essence, this rule is that if a tract existed as a separate unit under separate ownership at the time of the application of a spacing rule to the field in which it is located, the tract, however small, is entitled to at least one well as a matter of right.³⁶ This rule would seem to imply that a permit would not be granted for drilling a well on a portion of a subdivided tract if the subdivision occurs *after* the

³⁴ Rule 37 is one of the statewide Rules and Regulations of the Railroad Commission. It is the spacing rule applicable over the entire field. For a discussion of the Rule, see Hyder, *Some Difficulties in the Application of the Exceptions to the Spacing Rule in Texas*, 27 TEXAS L. REV. 481 (1949); Comment, 13 TEXAS L. REV. 119 (1934).

³⁵ Upon the completion of a well, and in some cases periodically during its producing life, it is necessary to permit open flow of gas or oil to lift accumulated debris out of the well.

³⁶ *Dailey v. Railroad Comm'n*, 133 S.W.2d 219 (Tex. Civ. App. 1939). A permit to drill a well may be granted to prevent confiscation even though the operation of the well causes waste. *Magnolia Petroleum Co. v. Railroad Comm'n*, 120 S.W.2d 553 (Tex. Civ. App. 1938); *Gulf Oil Corp. v. Wood*, 120 S.W.2d 543 (Tex. Civ. App. 1938).

application of the spacing rule to the area in which the tract is located and that portion is smaller than is required for a well under the spacing rule.³⁷ In this situation, however, the "doctrine of the *Century* case" is applied.³⁸ A tract subdivided subsequent to the application of Rule 37 to the field is viewed as it existed prior to the subdivision, and if the tract, so reconstructed, would be entitled to an additional well or wells, the Commission may grant a permit to one portion as an exception to the spacing rule in order to prevent confiscation of the property.³⁹

A second factor which has led to uneconomic density of wells in the great East Texas field is the rule of the Texas Railroad Commission, known as the "eight-times area rule," which permits the operator of any tract, regardless of its size, to drill wells on his tract equal in number to the average well-density prevailing in the area eight times the size of the operator's tract and immediately surrounding it.⁴⁰ The result has been that even the larger tracts in this field are drilled to a greater density than the one well to ten acres contemplated by the spacing rule applicable to that field, and the average density of the field as a whole is approximately one well to four acres. Obviously, inflexible application of such a rule would result in increasing the density of wells in the field, since the granting of a well permit on the basis of this rule automatically increases the density in the "eight-times area" of other nearby tracts.

The density of wells in certain of the Texas fields has been further increased by the grace of the Railroad Commission in instances where it was not required by law or its own rules to

³⁷ This is the so-called "voluntary subdivision rule." *Brown v. Humble Oil & Refining Co.*, 126 Tex. 296, 83 S.W.2d 935, *rehearing denied*, 87 S.W.2d 1069 (1935).

³⁸ *Railroad Comm'n v. Magnolia Petroleum Co.*, 130 Tex. 484, 109 S.W.2d 967 (1937).

³⁹ The Commission seems to have broad discretion in determining where the additional well or wells shall be located. *Railroad Comm'n v. Miller*, 165 S.W.2d 504 (Tex. Civ. App. 1942). See also Walker, *The Problem of the Small Tract under Spacing Regulations*, 57 TEX. BAR ASS'N PROCEEDINGS 157 (1938).

⁴⁰ WALKER, CASES ON OIL AND GAS 157 (1948), indicates that this is, strictly speaking, not a rule but a policy of the Commission. Moreover, the rule is purely evidentiary in character, and in *Thomas v. Stanolind Oil & Gas Cos.*, 145 Tex. 270, 198 S.W.2d 420 (1946), it was decided that the Commission could properly consider an area merely four times the size of the tract involved. In fields in which acreage is an important factor in the prorationing formula, this rule is not an appropriate factor in determining whether an exception should be granted to the spacing rule. *Kraker v. Railroad Comm'n*, 188 S.W.2d 912 (Tex. Civ. App. 1945), 25 TEXAS L. REV. 98 (1946).

grant permits. The Commission has discretionary authority to grant permits as exceptions to the spacing rules either to prevent confiscation or to prevent waste, and the normal practice is to express both grounds in the order granting an exception.⁴¹ Expert testimony to the effect that an additional well is essential to the prevention of waste is generally readily available (though, of course, there will be contrary expert testimony tendered by opponents of the exception), and it is therefore extremely difficult to obtain judicial overturning of a Commission order granting an exception to the spacing rule, although there have been numerous actions seeking this relief.⁴²

Although fields may thus be developed with a density greater than is permitted by the applicable spacing rules, the question remains why an operator would desire to drill so densely. It has been estimated that all but 3,000 or 4,000 of the 27,000 wells in the East Texas field are unnecessary. The waste of materials and labor in this field alone may well exceed one billion dollars, and the unnecessary drilling costs in Texas may well exceed fifty million dollars per year.⁴³ Why these unnecessary wells?

The inability of the Commission to limit the drilling of wells not necessary to insure maximum recovery from a pool has been due to the fact that in many instances allowables for prorationing have had to be on a "per well" basis.⁴⁴ This has not resulted from a conscious design of the Commission but from certain limiting

⁴¹ See, e.g., *Gulf Land Co. v. Atlantic Refining Co.*, 113 F.2d 902 (5th Cir. 1940), sustaining the action of the Commission in granting a permit on the ground of preventing waste as well as preventing confiscation of property, after the Supreme Court of Texas had enjoined drilling under an earlier permit granted on the theory of prevention of confiscation of property, *Gulf Land Co. v. Atlantic Refining Co.*, 134 Tex. 59, 131 S.W.2d 73 (1939).

⁴² The apparent readiness of the Commission to grant exceptions is perhaps to be explained by the belief of certain members in the "more wells, more oil" theory. See the testimony of Commissioner Thompson before the Cole Committee, *Hearings, supra* note 22, at 575. The Supreme Court of Texas, however, has refused to accept this dubious theory as a basis for the granting of a well permit. See *Hawkins v. Texas Co.*, 146 Tex. 511, 518-19, 209 S.W.2d 338, 342-43 (1948).

⁴³ See Davis and Willbern, *Administrative Control of Oil Production in Texas*, 22 TEXAS L. REV. 149, 154 (1944).

⁴⁴ See, e.g., the allowables in *Railroad Comm'n v. Rowan & Nichols Oil Co.*, 310 U.S. 573, as modified, 311 U.S. 614 (1940); *Railroad Comm'n v. Rowan & Nichols Oil Co.*, 311 U.S. 570 (1941); *Marrs v. Railroad Comm'n*, 142 Tex. 293, 177 S.W.2d 941 (1944). The Supreme Court has clearly indicated in *Burford v. Sun Oil Co.*, 319 U.S. 315, 317 (1943), that federal courts do not exercise appellate jurisdiction over administrative orders controlling well-spacing, and in the *Rowan & Nichols* cases it made it clear that the Commission's expert function in fixing allowables would not be supplanted by the federal courts.

factors: the "fair chance" rule and the Marginal Well Statute. A Texas court has explained that under the "fair chance" rule, the Railroad Commission

must, as far as practical, and within reasonable limitations, afford the several property owners a fair opportunity to produce the recoverable oil underlying their lands or its equivalent.

As a corollary to these rules, it is held that the owner of a [tract made separate before the application of the spacing rule to the area] cannot be denied the right to drill at least one well on his tract however small it may be. From which it would seem that his allowable cannot be cut down . . . below the point where [his well] could not be drilled and operated at a reasonable profit.⁴⁵

Moreover, the Marginal Well Statute,⁴⁶ applicable to pumping wells capable of only small production per day, imposes a minimum, increasing with the depth of the well, below which the Commission has no authority to fix an allowable.⁴⁷ For flowing wells the Commission has set a similar minimum allowable on a theory of equity, though possibly these allowables might legally be less.

These factors have encouraged the drilling of wells on small tracts even though the recoverable oil in place beneath the tract is not sufficient to repay the cost of drilling the well, for the driller is nevertheless allowed to produce enough from the pool (thus draining neighboring land) to make a profit.⁴⁸ This rule, in

⁴⁵ Railroad Comm'n v. Humble Oil & Refining Co., 193 S.W.2d 824, 832 (Tex. Civ. App. 1946).

⁴⁶ TEX. REV. CIV. STAT. ANN. art. 6049b (1949). Wells drilled to a depth of from 2000 to 4000 feet may not be given an allowable of less than 20 barrels a day.

⁴⁷ The Marginal Well Statute may sometimes serve the ends of conservation, however, for if the Commission were directed to prorate production within a field on such factors as acreage or potential, certain wells would receive such a small allowable as to make operation unprofitable. This would occasion abandonment of some wells which might result in physical waste of oil since some recoverable oil would be rendered nonrecoverable. On the other hand, there are fields where a selective abandonment of particular wells might result in increased ultimate recovery. The determination of whether abandonment of a particular well would increase or decrease ultimate recovery would depend upon a careful study of the geological conditions and pattern of drilling in a particular field.

⁴⁸ This obvious inconsistency between the "fair chance" rule permitting an owner to recover the oil in place beneath his own land and the principle, now codified in marginal well statutes, which assures the owner a minimum return from his well is not confined to Texas. See, e.g., MICH. COMP. LAWS c. 319, § 13 (1948), which requires that in the fixing of allowables, the rules, regulations and orders "shall, so far as it is practicable to do so, afford the owner of each property in a pool the opportunity to produce his just and equitable share of the oil and gas in the pool, being an amount . . . substantially in the proportion that the quantity of the recover-

conjunction with the Marginal Well Statute and the policy of applying similar minimum allowables for flowing wells, has meant that in many instances allowables have been primarily on a "per well" basis with little consideration of such other factors as acreage and potential productivity. The economic incentive for the drilling of additional and excessive wells in proven territory is particularly high when a townsite with its numerous small subdivisions overlies the producing structure, and the resultant waste of reservoir energy and of the oil itself may consequently be increased.

C. Pooling and Unitization

Certain of the factors limiting the power of regulatory agencies to insure appropriate development of a producing structure and to limit the number of wells have been indicated. As has been noted, prorationing and well-spacing have served the ends of conservation, but to a considerable extent, the hands of the regulatory commissions have been tied. They may best be untied by statutory process for compulsory pooling and unitization.⁴⁹

Pooling is important in the prevention of drilling of unnecessary and uneconomic wells, which will usually result in physical and economic waste.⁵⁰ Unitization is important where there is separate ownership of portions of the rights in a common producing pool in order that it may be made economically feasible to engage in cycling, secondary recovery operations such as pressure maintenance and reinjection, or explorations in depth. The best results in conservation can be attained only by unitization. Only in this way can appropriate use of reservoir pressures be made and secondary recovery operations utilized at the appropriate early stage in the exploitation of the oil deposits. Moreover, only with unitization of fairly sizable tracts is it economically feasible to utilize advanced methods of cycling for maximum extraction of liquid constituents from gas. Cycling operations should be con-

able oil and gas under such property bears to the total recoverable oil and gas in the pool . . .," but further provides certain minimum allowables based on the depth of the producing wells.

⁴⁹ The terms "pooling" and "unitization" are frequently used interchangeably, but here "pooling" is used to denominate the bringing together of small tracts sufficient for the granting of a well permit under applicable spacing rules, and "unitization" is used to describe the joint operation of all or some portion of a producing reservoir.

⁵⁰ The term physical waste is used herein to cover loss, above or below ground, of recoverable oil or gas; economic waste refers to economic losses occasioned by the drilling of unnecessary wells.

ducted under a program planned for a field as a whole in order to prevent wet gas from being segregated from producing wells by the dry gas fingering into the formation. Under such a program input and production wells could be located in accordance with the best engineering practices and without regard to lease or property lines.⁵¹

Compulsory process for pooling is found in a number of states.⁵² To the list were added the states of Arizona,⁵³ Colorado,⁵⁴ Illinois,⁵⁵ Washington⁵⁶ and Wyoming⁵⁷ by acts of the 1951 legislatures. This substantial increment in one year indicates the growing acceptance by the industry and the legislatures of the importance of this measure to prevent waste caused by excessive drilling. Still without such compulsory process are the important producing states of Kansas,⁵⁸ Montana and Texas,⁵⁹ and the

⁵¹ See Pressler, *Legal Problems Involved in Cycling Gas in Gas Fields*, 24 TEXAS L. REV. 19, 23 (1945).

⁵² Such process was available in the following states prior to 1951: Alabama, Arkansas, California, Florida, Georgia, Indiana, Louisiana, Michigan, Mississippi, New Mexico and Oklahoma. The several acts are collected in 5 and 5A SUMMERS, OIL AND GAS (perm. ed. 1951). In general there are few significant differences in the scope of the laws on pooling in these states except for California where the law applies to tracts of less than one acre in size. CAL. PUB. RES. CODE § 3608 (Supp. 1951), sustained in *Hunter v. Justice's Court*, 36 Cal.2d 315, 223 P.2d 465 (1950). In some of these states apparently the regulatory agency has the power to determine the size of the pooling unit, but in others, e.g., Alabama and Mississippi, the agency is limited to units of 40 acres or less. The constitutionality of these acts has been sustained. See, e.g., *Hunter Co. v. McHugh*, 202 La. 97, 11 So.2d 495 (1942), *appeal dismissed*, 320 U.S. 222 (1945).

⁵³ ARIZ. CODE ANN. c. 11, § 1706 (Supp. 1951).

⁵⁴ COLO. STAT. ANN. c. 118, § 68(6) (Supp. 1951).

⁵⁵ ILL. ANN. STAT. c. 104, § 83a (Supp. 1951).

⁵⁶ Wash. Laws 1951, c. 146, § 26.

⁵⁷ WYO. COMP. STAT. ANN. § 57-1113 (Supp. 1951).

⁵⁸ There are no express provisions in the statutes of Kansas relative to pooling or unitization. Under its police power, the city of Oxford, Kansas, was permitted to limit drilling of wells to one per city block. *Marrs v. City of Oxford*, 24 F.2d 541 (D. Kan.), *aff'd*, 32 F.2d 134 (8th Cir. 1928), *cert. denied*, 280 U.S. 573 (1929).

⁵⁹ Neither pooling nor unitization may be imposed by compulsory process under the existing law either by the Railroad Commission or by the courts. *Pickens v. Ryan Consol. Petroleum Corp.*, 219 S.W.2d 150 (Tex. Civ. App. 1949). In the exercise of the police power, municipalities may limit drilling within the city limits and require pooling to form a well site for drilling purposes. *Tysco Oil Co. v. Railroad Comm'n*, 12 F. Supp. 202 (S.D. Tex. 1935). In a companion case, the validity of a Railroad Commission order which provided that spacing of wells should be limited to that set in the city ordinance was sustained. *Tysco Oil Co. v. Railroad Comm'n*, 12 F. Supp. 195 (S.D. Tex. 1935). TEX. STAT., REV. CIV. art. 6014(g) (1948) prohibits the Railroad Commission from ordering compulsory field unitization. Voluntary unitization is permitted. TEX. STAT., REV. CIV. art. 6008, § 21 (1948). Shank,

state of North Dakota, which apparently has large potential production.

Compulsory unitization of comprehensive scope is not available in any state.⁶⁰ The statutes of widest scope are those of Oklahoma and Arkansas. The Oklahoma statute,⁶¹ enacted in 1945 and subsequently replaced by a similar statute, gave authority to the Corporation Commission to impose unitization on a pool or part thereof as against the objection of small minority interests. Before steps could be taken to accomplish unitization under this law, a petition by owners or lessees⁶² of 50 percent of the land proposed to be unitized was required, and opposition by owners or lessees of 15 percent or more of the land operated as a veto upon the program. This unitization law and an order of the Corporation Commission pursuant thereto providing for the unitized management, operation and further development of the "West Cement Medrano Unit" were sustained as constitutional in *Palmer Oil Corp. v. Phillips Petroleum Co.*⁶³ On appeal to the United States Supreme Court, the causes were ordered continued for such period

Pooling Problems, 28 TEXAS L. REV. 662, 666 (1950), suggests that the Texas Railroad Commission has some indirect powers of compulsion in the matter of pooling.

⁶⁰ In the absence of statutory authorization, neither the regulatory agency nor the courts may compel unitization, however desirable it may be. *Western Gulf Oil Co. v. Superior Oil Co.*, 92 Cal. App.2d 299, 206 P.2d 944 (4th Dist. 1949); *Pickens v. Ryan Consol. Petroleum Corp.*, 219 S.W.2d 150 (Tex. Civ. App. 1949). It is possible that the Commission may be able to accomplish indirectly in some instances what it cannot do directly. It may order operations which as a practical matter can be accomplished only through cooperative efforts and thereby provide a compelling incentive to unitized operations, e.g., repressuring. See Walker, *The Problem of the Small Tract under Spacing Regulations*, 57 TEX. BAR ASS'N PROCEEDINGS 157, 168 (1938); AMERICAN BAR ASS'N, CONSERVATION OF OIL AND GAS 471-72 (1949).

⁶¹ OKLA. STAT. ANN. tit. 52, §§ 286.1-17 (1950).

⁶² Lessors were given no voice in the matter under the 1945 statute. Many lessors thought that this placed them at the mercy of the lessees whose interests might not in all cases coincide with the interests of particular lessors. See note 66 *infra*.

⁶³ 204 Okla. 543, 231 P.2d 997 (1951). It is significant that even prior to the adjudication of the constitutionality of this law, which was bitterly contested, there had been considerable use made of its provisions, and several of the larger and more prolific fields in the state had been unitized. Williams, *The Negotiation and Preparation of Unitization Agreements* in SOUTHWESTERN LEGAL FOUNDATION, FIRST ANNUAL INSTITUTE ON OIL AND GAS LAW 43 (1949). Hardwicke and Summers have characterized the Oklahoma statute as the most comprehensive of all statutes on the subject and as representing "an effort to find middle ground between: (a) giving virtually unrestricted power to the administrative agency on the one hand; and (b) on the other hand, of so restricting its power that no effective action can be taken." Hardwicke and Summers, *Statutes Relating to Secondary-Recovery Operations* in AMERICAN PETROLEUM INSTITUTE, SECONDARY RECOVERY OF OIL IN THE UNITED STATES 46 (2d ed. 1950).

as will enable appellants to secure in an appropriate state proceeding a determination as to the effect of the statute's repeal in May, 1951, on the matters raised in the appeals.⁶⁴

Though technically the unitization law was repealed, a new unitization law was enacted⁶⁵ which in many respects is the same as the earlier law though containing certain changes.⁶⁶ Among the more important of the changes are the following:

1. Provisions are made for royalty interest participation in setting up the unit. Under the earlier law, royalty owners and lessors had no voice in the matter.

2. The terms of the unitization are to be prescribed by the Corporation Commission rather than by agreement of operators.

3. The former exemption of fields over 20 years old or fields already operating under pressure maintenance, repressuring or secondary recovery programs is eliminated.

4. The provisions for representation of each lessee on the operating committee and for voting weight proportional to interests are eliminated.

5. The procedure for setting up the unit has been changed to require affirmative assent of at least 63 percent of lessees and 63 percent of royalty owners, by area, within 6 months of the order creating the unit. The procedure for a veto by 15 percent of the lessees has been dropped.

6. Express provision is made that neither the statute nor any plan of unitization should be construed as increasing or decreasing the implied covenants of a lease⁶⁷ in respect to a common source of supply or lands not included within the unit area of a unit.

In Arkansas, the regulatory commission ordered compulsory unitization of the McKamie-Patton field in 1948 by an order which apparently met with the approval of 96 percent of the operators and royalty owners. Opposition of minority interests had prevented the achievement of a voluntary program of great importance in maximizing ultimate recovery from the field. In

⁶⁴ *Palmer Oil Corp. v. Amerada Petroleum Corp.*, 342 U.S. 35 (1951).

⁶⁵ OKLA. STAT. ANN. tit. 52, §§ 287.1-15 (Supp. 1951).

⁶⁶ The impetus for most of the changes came from royalty owners who felt that the old law was too heavily weighted in favor of operators. See Garvin, *The Effect of Field Unit Operations upon the Royalty Interest and the Royalty under the Oklahoma Statute*, 21 OKLA. B.A.J. 1793 (1950).

⁶⁷ See generally on implied covenants, MERRILL, *COVENANTS IMPLIED IN OIL AND GAS LEASES* (2d ed. 1940). Of particular concern in this connection are the implied covenants to explore and to develop.

Dobson v. Arkansas Oil and Gas Comm'n,⁶⁸ the Supreme Court of Arkansas held that the Commission was without authority to compel unitization, but limited recovery by the dissident royalty owners to the amount of royalty payable on their fair share of the pool, irrespective of the amount of oil actually produced from wells on their lands.

At all events the legislative reaction was almost immediate, and a grant of authority to the Commission to compel unitization under certain conditions was clearly made. In 1951, compulsory unitization was authorized where necessary to prevent waste, to increase ultimate recovery of the oil or gas, and to protect correlative rights.⁶⁹ Before the Commission may consider ordering such unitization, however, assent must be obtained by owners of record legal title to at least an undivided 75 percent in the right to drill into and produce the oil or gas from the total proposed unit area and of owners of record legal title to 75 percent of royalty and over-riding royalty⁷⁰ payable with respect to the oil or gas produced from the entire unit area. The Commission is without power to impose unitization on its own motion. In three respects therefore the accomplishment of unitization is rendered more difficult in Arkansas than in Oklahoma: 75 percent assent is required as against 63 percent in Oklahoma; this assent must be obtained from owners of operating and all types of non-operating interests where Oklahoma requires only the assent of operating and royalty interests; assent must be secured in advance, where Oklahoma allows six months following the order creating the unit.

In four states (Louisiana, Alabama, Georgia and Florida)⁷¹ compulsory process is available to accomplish unitization for purposes of cycling operations, but not for other purposes. In Washington, unitization may be ordered by the regulatory commission when in its judgment, "production in any pool or field shall have declined to a point where secondary recovery operations are . . . necessary." In such cases, unitization may be

⁶⁸ 218 Ark. 160, 235 S.W.2d 33 (1950).

⁶⁹ ARK. STAT. ANN. § 53-115 (Supp. 1951).

⁷⁰ An overriding royalty, as distinguished from a landowner's royalty, is a fractional share of production carved out of the lessee's working interest under the original lease. This type of interest is frequently created upon an assignment of all or a portion of a leasehold.

⁷¹ The governing statutes are collected in 5 and 5A SUMMERS, OIL AND GAS (perm. ed. 1951). The Louisiana statute was impliedly upheld in *Crichton v. Lee*, 209 La. 561, 25 So.2d 229 (1946).

ordered "in connection with the conduct of repressuring or pressure maintenance operations, cycling or recycling operations, including the extraction and separation of liquid hydrocarbons from natural gas in connection therewith, or any other method of operation, including water floods."⁷² In 22 states,⁷³ and by an Act of Congress as concerns federal lands subject to the Leasing Act,⁷⁴ there is authority for voluntary agreements for secondary recovery or related operations under certain circumstances. The typical state act provides that such voluntary agreements are exempted from the operation of state antitrust laws.

To achieve the maximum objectives of a unitization program it is necessary that all persons having an interest in the program area become subject to the agreement.⁷⁵ Without statutory compulsion, however, unanimity is frequently impossible to obtain. The principal obstacle to full, voluntary agreement is the problem of dividing the proceeds of production. If development of the area sought to be unitized is incomplete, there is a certain amount of gambler's instinct to be overcome; some lessors and lessees may be inclined to rely on the possibility that their interests lie in the most favorable part of the producing structure and to take their chances that the entire production from their land will be more valuable than an undivided interest in production from a much larger unitized tract. If development of the pool is relatively complete, there is frequently acrimony as to the respective shares

⁷² Wash. Laws 1951, c. 146, § 36.

⁷³ These states are Arizona, Alabama, Arkansas, California, Colorado, Florida, Georgia, Illinois, Indiana, Kentucky, Mississippi, Montana, Nebraska, New Mexico, North Carolina, North Dakota, Oklahoma, South Dakota, Texas, Utah, Washington and Wyoming. In Washington and Wyoming, new statutes in 1951 made clearer the right to enter into voluntary agreements for certain purposes, and Indiana, in amending its conservation law in that year, reenacted the provision authorizing voluntary agreements. See Hardwicke, *Unitization Statutes: Voluntary Action or Compulsion*, 24 ROCKY MT. L. REV. 29, 42 (1951).

⁷⁴ The basic governing legislation on leasing of the public domain is found in the Mineral Leasing Act of 1920, 41 STAT. 437 (1920), as amended, 30 U.S.C. §§ 181 *et seq.* (1946). Section 17(b) of the 1946 Leasing Act, 60 STAT. 950, 952, 30 U.S.C. § 226e (1946), makes possible the inclusion of federal lands in unitization operations with private operators. The Secretary of the Interior has issued a suggested form of unit agreement. 12 FED. REG. 528 (1947). As of Jan. 1, 1951, there were 181 unit agreements in effect, covering 2,623,261 acres. During 1949, of all production under leases under the Mineral Leasing Act (which accounted for about 5 percent of the total production in the United States), over 53 percent of oil and 75 percent of gas were produced under unit agreements.

⁷⁵ See Miller and Shea, *Report on Recent Progress in Petroleum Development and Production*, Hearings, *supra* note 22, at 320, 397.

of production to be given owners of interests in favorable parts of the structure and owners of interests in less favorable areas, for example, persons with interests overlying the gas-cap⁷⁶ of a gas-driven pool.

It is possible, however, in some instances to accomplish a unitization program with less than 100 percent concurrence by parties in interest, for persons who do not join in the program may be left without complaint even though the operation of the unitization program does incidental damage to their financial interests. Thus in *Tide Water Associated Oil Co. v. Stott*,⁷⁷ it was held that where the lessor of a tract refused to accept a fair offer from his lessee to cooperate in a unitization program for recycling of gas, he had no ground to complain that the effect of such a program was to drive "wet" gas from under his land by reason of reinjection of "dry" gas on neighboring land under the recycling program.

However, it must be remembered that the land of the nonjoining lessor or lessee may not be used to achieve maximum effectiveness in the program. In *Ramsey v. Carter Oil Co.*,⁷⁸ it was held that a nonjoining lessor may bar the lessee's use of a well on the tract as an input well under a unitization program to which the lessee but not the lessor was a party. The court so held despite proof by the lessee that the operation was prudent and that the ultimate result of the program would be to increase the production from plaintiff-lessor's land.

Among the other frequently voiced theories as to the reason voluntary unitization programs have not been more common is that of fear of action under the federal antitrust laws.⁷⁹ Only one

⁷⁶ When the volume of gas in a reservoir exceeds the amount dissolved in the oil, the excess gas exists in a free state as a gas cap above the oil zone. Expansion of this gas into the oil zone provides the energy for production from this type of reservoir. See INTERSTATE OIL COMPACT COMM'N, OIL AND GAS PRODUCTION 37 (1951).

⁷⁷ 159 F.2d 174 (5th Cir. 1946), cert. denied, 331 U.S. 817 (1947).

⁷⁸ 172 F.2d 622 (7th Cir.), cert. denied, 337 U.S. 958, rehearing denied, 338 U.S. 842 (1949).

⁷⁹ See, e.g., King, *Pooling and Unitization of Oil and Gas Leases*, 46 MICH. L. REV. 311, 326 (1948); DAVIES, PAPERS PRESENTED BY THE PETROLEUM ADMINISTRATION FOR WAR BEFORE THE UNITED STATES SPECIAL COMMITTEE TO INVESTIGATE PETROLEUM RESOURCES 12 (1945).

Mention should be made of two other points of contact between the Federal Government and unitization programs. Under certain circumstances, unit operations may lead to the imposition of corporate taxes on the organization. It has been suggested that this has deterred some such operations. See FANNING, OUR OIL RESOURCES 12 (2d ed. 1950); Jacobs, *Unit Operation of Oil and Gas Fields*,

action directly relative to a unitization program has thus far been brought. This is the *Cotton Valley* case, started in the District Court for the Western District of Louisiana on June 17, 1947. This case was dismissed by the trial court on grounds not related to the merits of the issue,⁸⁰ and no other case involving a unitization agreement has been filed. Ely has suggested that this case

has become a cause celebre within the oil industry because of the possibility of direct federal intervention in state conservation practices; the defendants and the industry pointed out that the Louisiana Commissioner of Conservation has specifically approved the unit plan for the field. The Department of Justice, in announcing the filing of the suit, stressed that it was not its purpose to attack "joint activity of the defendant in the production of wet gas, in the removal of hydrocarbons, or in the maintenance of underground pressure through re-injection of part of the dry gas back into the underground reservoir, or any activity which is necessary or essential to the conservation of natural resources or the prevention of waste." The announced position of the Department is that the action is directed toward joint processing and refining of the products removed from wet gas, and the sale of these products jointly through selected trade channels. The complaint specifically alleges that the order of the Louisiana Commissioner of Conservation approved the agreement only to the extent that it provided for unit operation and the re-injection into the reservoir under pressure of a part of the liquid and gaseous hydrocarbons produced from the field. The case is unique not only because it is the first attempt to apply the Sherman Act to unit operations, but also because it rests upon an assertion of federal power in a field hitherto considered to comprise only intrastate activities.⁸¹

57 YALE L.J. 1207, 1221 (1948). At the moment at least, rulings by the Bureau of Internal Revenue have permitted unit operators to avoid taxability as an association or corporation. I.T. 3930, 1948-2 CUM. BULL. 126; I.T. 3948, 1949-1 CUM. BULL. 161. On the other hand, federal control of materials by the Petroleum Administration for War during World War II greatly encouraged unitization. Under Conservation Order M-68 and PAO-11, drilling was limited to one oil well per 40 acres and one gas well to each 640 acres (subject to a number of exceptions). See FREY AND IDE, HISTORY OF THE PETROLEUM ADMINISTRATION FOR WAR 180 (1946). The Petroleum Administration for Defense, created under the Defense Production Act of 1950, 64 STAT. 798 (1950), 50 U.S.C. § 2061 (Supp. 1951), could exert a similar influence through its power to allocate new oil country steel tubing, but as yet it has not used its power for the purpose of encouraging unitizations.

⁸⁰ The dismissal was affirmed by an equally divided Court without opinion. *United States v. Cotton Valley Operators' Comm.*, 339 U.S. 940, *rehearing denied*, 339 U.S. 972 (1950).

⁸¹ Ely, *The National Government and the Conservation of Oil and Gas in AMERICAN BAR ASS'N, CONSERVATION OF OIL AND GAS* 599, 634 (1949).

The position of the Department of Justice as indicated by its formal papers and press releases relating to the *Cotton Valley* case seems to be that any agreement to produce in conformity with a uniform plan *affects* commerce, but that unitization agreements for the sole purpose of carrying out conservation principles are *reasonable* restraints of trade and hence valid. It seems probable that approval of an agreement and issuance of enabling orders by a state conservation agency in the exercise of its statutory functions would be strongly persuasive that the operations are in accord with sound engineering principles. The mere fact of such approval would not, however, be conclusive evidence that the sole purpose of the program was conservation. If the agreement calls for joint action after the conservation principles have been practiced, as by creation of a common selling agency, fixing prices of products sold,⁸² adoption of uniform sales contracts, cooperative refining and joint sale of the products with division of profits of operation, or channeling the entire production to a single refinery or pipe line, it may be vulnerable under the antitrust laws.⁸³

It is possible merely to hazard a guess as to the influence of the professed fear of prosecution under the antitrust laws upon the success of voluntary unitization programs. Hardwicke, who may not be characterized as anti-industry in thinking and motivation, has suggested that "In some instances, the fear may be simulated, and the operator may be merely playing poker."⁸⁴ He concludes that the antitrust laws do not condemn the making and carrying out of agreements for unitized operations which are reasonably necessary to prevent waste and protect correlative rights, and he argues that in any case antitrust problems in unitization would be obviated where unitization is compelled by the

⁸² As has been previously suggested, prorationing itself has certain price-fixing tendencies, but the relationship between prorationing and conservation is more readily apparent than the relationship between price-fixing by a group of producers and conservation.

⁸³ The argument for joint processing as a part of permitted unitization for recycling is made by Errebo, *United Operation at Cotton Valley*, 24 TULANE L. REV. 76, 82 (1949): "The net result of joint processing is the postponement of the time when the costs of production and of refining will equal the market price and consequently unitization results in a substantial increase — by hundreds of thousands of barrels — in the oil which can be economically recovered from a pool."

⁸⁴ HARDWICKE, *ANTI-TRUST LAWS, ET AL. V. UNIT OPERATION OF OIL OR GAS POOLS* 154 (1948).

state.⁸⁵ Similarly, the Legal Committee of the Interstate Oil Compact Commission concluded that the possibility of application of federal antitrust laws to agreements and operations for secondary recovery and related operations seemed too remote to give much ground for recommending federal legislation providing exemption under the antitrust laws similar to that proposed by the Commission for the states.⁸⁶

D. Other State Conservation Measures

In view of the multifarious nature of administrative regulation of development and production and the variations from state to state, a detailed analysis of such regulations is not possible here.⁸⁷ However, a few of the important problems attempted to be solved by administrative regulation will be mentioned. Among these are the economic utilization of casinghead gas, "end-use" controls, and the fixing of an equitable minimum price for gas.

The conservation problem over which there is the greatest controversy concerns the disposition of casinghead gas. Advances have been made towards the solution of this problem, but much remains to be done to eliminate as nearly as possible the time-honored custom of "flaring" such gas. One hindrance to the marketing of the gas is the fear of control by the Federal Power Commission⁸⁸ of the production process. This fear, arising from the absence of a clear definition of the statutory exemption of "production and gathering"⁸⁹ in the Natural Gas Act has caused

⁸⁵ *Id.* at 169-74. Hardwicke reasons from *Parker v. Brown*, 317 U.S. 341 (1943), where the Supreme Court held that the California raisin proration program instituted by the state did not violate the Sherman Act. The Court concluded that the Sherman Act was directed at private action, not state action, in restraint of trade. *But cf.* *Schwegmann Bros. v. Calvert Distillers Corp.*, 341 U.S. 384 (1951).

⁸⁶ HARDWICKE, *op. cit. supra* note 84, at 150; 6 INTERSTATE OIL COMPACT Q. BULL. 73, 76 (Aug. 1947).

⁸⁷ Illustrative of the complexity of such regulations is the fact that a collection of state-wide Rules and special Field Rules or orders of the Texas Railroad Commission runs to a loose-leaf compilation of more than 1000 pages.

⁸⁸ By the terms of the Natural Gas Act of June 21, 1938, 52 STAT. 821, 15 U.S.C. § 717 (1946), the business of transporting and selling natural gas for ultimate distribution to the public was declared affected with a public interest, and provisions for regulation by the Federal Power Commission were made.

⁸⁹ 52 STAT. 821 (1938), 15 U.S.C. § 717(b) (1946). The history of the interpretation of this section has been confused. See Staff Report, *Section 1(b) of the Natural Gas Act with Reference to Production and Gathering* in FPC INVESTIGATION OF THE NATURAL GAS INDUSTRY 4 *et seq.* (Docket No. G-580 1947). Compare the majority and minority views in H.R. REP. NO. 1140, 81st Cong., 1st Sess. (1949). *Interstate Natural Gas Co. v. FPC*, 331 U.S. 682 (1947), strongly indicated that the FPC has

many independent producers of petroleum, that is, those who do not own pipelines, to hesitate or decline to sell residue gas from oil wells to pipeline companies for interstate transmission or sale.⁹⁰ Whether or not their apprehension is justified, some operators have preferred to flare rather than sell this gas.

Perhaps more important as a reason for the waste of casing-head gas is that frequently it has not been considered profitable to save much gas. The market for this gas has been negligible, partly because the need for natural gas was readily met from gas fields, partly because of the expense of gathering the gas and making it suitable for transportation through trunk lines for consumer use, and partly because of the fluctuating character of the supply. Great progress has been made in extracting the liquid hydrocarbons from the casinghead gas, but "it must not be assumed that the construction or operation of a plant is even now economically feasible in any and all fields."⁹¹ Finally, the useful alternative to selling the gas, a reinjection program, may be prohibitively expensive unless based on unit operation or field-wide cooperation.

The regulatory agencies have taken some steps to require the saving of this gas,⁹² but they are not inclined to enter an order

authority to regulate prices on sales of gas by independent producers to interstate pipe line companies. *But cf.* *Columbian Fuel Corp.*, 2 F.P.C. 200, 208 (1940). The Commission has vacillated with changes in its personnel in its interpretation of this provision. In the most recent decision, by a four to one vote, it was decided not to take jurisdiction over sales to pipe lines by Phillips Petroleum Co. Phillips Petroleum Co., CCH UTIL. LAW REP. ¶ 9235 (FPC 1951). See Berger and Krash, *The Status of Independent Producers Under the Natural Gas Act*, 30 TEXAS L. REV. 29 (1951). The Kerr Bill, H.R. 1758, S. 1498, 81st Cong., 1st Sess. (1949), was designed to make specific the absence of authority of the Commission over sales by independent producers to pipe line companies. This bill was vetoed by the President.

⁹⁰ See, e.g., Wheat, *Administration by the Federal Power Commission of the Certificate Provisions of the Natural Gas Act*, 14 GEO. WASH. L. REV. 194, 207 (1945); Hardwicke, *Texas, 1938-1948* in AMERICAN BAR ASS'N, CONSERVATION OF OIL AND GAS 483 (1949); *A National Oil Policy for the United States*, formulated by the National Petroleum Council at the request of the Secretary of the Interior and presented Jan. 13, 1949, printed in FANNING, OUR OIL RESOURCES 7, 18 (2d ed. 1950); Staff Report, *Section 1(b) of the Natural Gas Act with Reference to Production and Gathering* in FPC INVESTIGATION OF THE NATURAL GAS INDUSTRY 35-37 (Docket No. G-580 1947).

⁹¹ Hardwicke, *Texas, 1938-1948* in AMERICAN BAR ASS'N, CONSERVATION OF OIL AND GAS 485 (1949).

⁹² At least as early as 1945 the Texas Railroad Commission began to control the flaring of gas when it held a hearing on the problem with reference to the Heyser field. In 1947 it issued an order for the Seeligson field directing that all wells be shut down until the gas produced from the oil wells was saved and used for purposes permitted by law. In 1948 an order prohibiting flaring in the Heyser field issued.

unless convinced that it is economically feasible to dispose of the residue of the casinghead gas by sale or reinjection. In Texas the general tenor of an important opinion⁹³ of the state supreme court would seem to prohibit any other policy on the part of the Railroad Commission. The problems of the economical use of the residue of casinghead gas were graphically depicted in Justice Garwood's dissent in this case:

When a large potential gas purchaser moved into the area, efforts were evidently made in good faith by some of the leading producers of the field to bring about a sale of the residue, but the problem was such as naturally to require considerable negotiation and delay — particularly since the field was divided into a substantial number of different ownerships, all or many of whom had to agree on a program, including the investment of very large sums of money in equipment, before the terms offered by the potential buyer could be met. The evidence shows that from the standpoints of the producers the sale of the residue gas on the terms finally agreed upon is of doubtful economic benefit, while the evident independence of the buyer about seeking the product suggests that the arrangement is at least not a highly desirable one from its standpoint.⁹⁴

An entirely different type of conservation measure is the prohibition or regulation of the use of natural gas for the manufacture of carbon black. "End-use" controls of this type are designed, not to maximize recovery, but to stretch the available supply of gas over a longer period of time by prohibition of the use of the gas for relatively less beneficial or important uses. The availability of an adequate supply of carbon black is of obvious importance,⁹⁵ but the fact that it may be manufactured from other products in more abundant supply justifies regulation of the use of natural gas for the manufacture of this product. Typical legislation or regulation prohibits the use of sweet gas for the manufacture of carbon black where sour gas (gas containing hydrogen sulphide) is available, or prohibits certain manufacturing processes which are less efficient in terms of total recovery of carbon black or in terms of utilization of the energy generated in the process.⁹⁶ The

This order was sustained in *Railroad Comm'n v. Sterling Oil & Refining Co.*, 147 Tex. 547, 218 S.W.2d 415 (1949).

⁹³ *Ibid.*

⁹⁴ *Id.* at 569, 218 S.W.2d at 427.

⁹⁵ The rubber industry uses about 95 percent of the carbon black produced, chiefly in tires. No satisfactory substitute for carbon black has been found.

⁹⁶ See Moses, *Statutory Regulations in the Carbon Black Industry*, 20 *TULANE L. REV.* 83 (1945), for a discussion of the state of the law on this subject up to 1945. A major regression in this conservation project was effected by the Texas

authority of the states in this area has regularly been sustained.⁹⁷

In connection with the scope of FPC power to regulate end-uses, the Natural Gas Act has again caused concern to the petroleum industry.⁹⁸ A number of interested groups have urged that the power exists and should be exercised. At various hearings of the Commission on the granting of permits for the construction of pipe lines, representatives of the coal industry and of unions have presented evidence that use of gas in certain industries was economically wasteful and have urged that such use should be prohibited.⁹⁹ Although doubtful at first of its authority, the FPC has come to assert power over some end-uses of gas,¹⁰⁰ and there is little doubt that an express grant of this power could constitutionally be made by Congress. Apart from carbon black regulations, however, end-use controls by either the federal or state governments have been infrequently exercised.

Price-fixing, a new movement marching under the banner of "conservation," was recently given the imprimatur of the Supreme Court. In two states, Oklahoma and Kansas, regulatory agencies have fixed minimum well-head prices for natural gas, and the legislatures of Texas and Louisiana have considered measures authorizing such practices. Such a program has a strong appeal for legislators in producing states. These legislators represent in large part constituents who have an economic interest in royalties based on

legislature in 1947 in authorizing the use of sweet gas in the manufacture of carbon black under certain conditions (relating to the nature of the reservoir, date of completion of the well and the nature of the well, availability of a pipe line, efficiency of the process used to recover carbon black, and price or royalty paid for the gas). TEX. STAT., REV. CIV. art. 6008, § 3 (1948). By the Act of April 9, 1948, the Mississippi legislature included within the definition of prohibited waste "the use of gas from gas wells, except sour gas, for the manufacture of carbon black, except and unless the [Oil and Gas] board shall find that there are no adequate pipe line connections to otherwise market the gas." MISS. CODE ANN. § 6132-08 (Supp. 1950). The history of the treatment of the problem in Kansas is discussed by Jay C. Kyle in AMERICAN BAR ASS'N, CONSERVATION OF OIL AND GAS 183 (1949).

⁹⁷ *Walls v. Midland Carbon Co.*, 254 U.S. 300 (1920); *Henderson Co. v. Thompson*, 300 U.S. 258 (1937).

⁹⁸ See Wheat, *Administration by the Federal Power Commission of the Certificate Provisions of the Natural Gas Act*, 14 GEO. WASH. L. REV. 194, 208 (1945); Newcomb, *Effect of Federal Regulation under the Natural Gas Act upon the Production and Conservation of Natural Gas*, 14 GEO. WASH. L. REV. 217, 238-242 (1945); FANNING, OUR OIL RESOURCES 18 (2d ed. 1950).

⁹⁹ See, e.g., the briefs filed in the Natural Gas Investigation on Docket No. G-580 and in *National Coal Ass'n v. FPC*, 191 F.2d 462 (D.C. Cir. 1951).

¹⁰⁰ See *Northern Natural Gas Co.*, 4 F.P.C. 1099 (1945) (prohibition of use of gas under boilers); Comment, *Jurisdictional Conflicts under the Natural Gas Act*, 17 U. OF CHI. L. REV. 479 (1950).

the value of the product at the well-head; they are also quick to perceive the beneficial influence on state fiscal programs of increased returns from state taxes based on the value of the minerals severed from the soil.

The action by the Oklahoma Commission was sustained as valid in *Cities Service Gas Co. v. Peerless Oil & Gas Co.*¹⁰¹ The opinion indicates that the Commission "heard testimony to the effect that the field price of gas has a direct bearing on conservation. Witnesses testified that low prices make enforcement of conservation more difficult, retard exploration and development, and result in abandonment of wells long before all recoverable gas has been extracted. They also testified that low prices contribute to an uneconomic rate of depletion and economic waste of gas by promoting 'inferior' uses."¹⁰² The Commission concluded that "the taking of gas at the prevailing prices resulted in both economic and physical waste of gas, loss to producer and royalty owners, loss to the State in gross production taxes, inequitable taking of gas from the common source of supply, and discrimination against various producers in the field."¹⁰³ On the basis of such findings, the Commission issued the challenged order.

In sustaining the Commission's order, the Court reasoned that It is now undeniable that a state may adopt reasonable regulations to prevent economic and physical waste of natural gas. . . . Like any other regulation, a price-fixing order is lawful if substantially related to a legitimate end sought to be attained. . . . In the proceedings before the Commission in this case, there was ample evidence to sustain its finding that existing low field prices were resulting in economic waste and conducive to physical waste. That is a sufficient basis for the orders issued. It is no concern of ours that other regulatory devices might be more appropriate, or that less extensive measures might suffice.¹⁰⁴

It is apparent, therefore, that at least two considerations support the Court's decision: (1) the prevention of economic loss to and discrimination against certain producers, with resulting reduction in state production taxes, and (2) the control of waste of the state's natural resources, caused either by failure to extract

¹⁰¹ 340 U.S. 179 (1950). The Kansas Act was held valid in *Kansas-Nebraska Natural Gas Co. v. State Corp. Comm'n*, 169 Kan. 722, 222 P.2d 704 (1950). See Johnson, *Federal and State Control of Natural Resources*, 4 VAND. L. REV. 739 (1951).

¹⁰² 340 U.S. at 182-83.

¹⁰³ *Id.* at 183.

¹⁰⁴ *Id.* at 185-86.

recoverable gas or by diversion of the gas to "inferior" uses. The Court stressed the second consideration in determining that the Commission's order did not violate the Due Process Clause or conflict with the national interest under the Commerce Clause. It is questionable, however, whether the first consideration alone would suffice to justify a state price-fixing regulation.¹⁰⁵

In considering the effect of such price-fixing measures, it should be noted that in terms of conservation they may not be an un-mixed blessing. There can be no doubt that an increase in prices will probably stimulate exploration, efforts to conserve casinghead gas as the increased price makes such efforts economically feasible, and deceleration of the move from coal to natural gas for industrial and domestic uses. On the other hand, conservation objectives may be defeated in part in distillate fields in that the field price for gas would have a marked effect on the volume of gas which might be returned to the formation from cycling plants. If the price of gas were higher and if there were a present market for it, the incentive to sell such gas would be increased. The result would be an increase in retrograde condensation¹⁰⁶ in the reservoir following reduction of pressure and a decrease in the ultimate recovery of liquid hydrocarbons by perhaps 25 percent.¹⁰⁷ Loss of liquid hydrocarbons in distillate fields by reason of failure to maintain pressures may be as high as 65 percent.¹⁰⁸

III. A POLICY FOR THE FUTURE

The reaction of the producing states to the problems of conservation of oil and gas in the past ten years has generally been good. In a number of instances there has been a re-evaluation of the effectiveness of existing conservation measures and enactment of new and more comprehensive statutes. There is a noticeable trend towards adoption of laws permitting or requiring pooling or unitization. Similarly the industry has taken a more far-sighted attitude towards the problems of conservation in recent years and has given encouragement to the enactment of more comprehensive

¹⁰⁵ Cf. *The Supreme Court, 1950 Term*, 65 HARV. L. REV. 107, 142-43 (1951).

¹⁰⁶ The term retrograde condensation describes the phenomenon of formation of a liquid from a gas as the pressure falls in a distillate field. Normally reduction in pressure results in the transformation of a liquid to a gas. See INTERSTATE OIL COMPACT COMM'N, OIL AND GAS PRODUCTION 55-56 (1951).

¹⁰⁷ Staff Report, *Practices and Problems in Producing, Gathering and Processing Natural Gas* in FPC INVESTIGATION OF THE NATURAL GAS INDUSTRY (Docket No. G-580 1947).

¹⁰⁸ *Hearings*, *supra* note 22, at 1222.

conservation laws. As an example it may be noted that compulsory unitization has been urged editorially by a leading trade journal.¹⁰⁹

There remains much to be done, however, towards the conservation of oil and gas.¹¹⁰ The basic need currently is for enactment of adequate conservation statutes in the states still deficient in this respect. Such statutes should be charters for regulation within clearly stated limits rather than detailed codes leaving the administrative agency without sufficient flexibility to develop policies in response to needs and experience. There should be a broad definition of prohibited waste to be implemented by rules, regulations and orders of an administrative agency.

There is an obvious risk of industry control of the regulatory agency in opposition to conservation. Certain of the objectives of a conservation program would, however, meet with the virtually unanimous support of the industry. In other areas, the interests of the industry may lead to some "dragging of the feet" in the adoption of conservation measures genuinely in the public interest. The long struggle to prevent flaring of casinghead gas is an example of the type of controversy which may arise. Under no system of regulation, however, can there be assurance that conservation measures will be adopted prior to their becoming economically profitable, whether such regulation be state or national in character, although the reasonably aggressive program pursued by some of the state agencies, such as the Texas Railroad Commission, indicates that the probabilities of early adoption are not less in the case of state regulation than in the case of federal regulation.

There is no real question as to the constitutionality of federal intervention in this area, and the threat of such intervention might provide adequate incentive for legislative action in the states now deficient as regards conservation. It might even be feasible to have federal legislation providing for compulsory pooling and unitization and other conservation measures with a provision exempting from the application of the law states in which local laws provide equivalent means of achieving the same ends.¹¹¹

¹⁰⁹ 50 OIL & GAS J. 53 (July 12, 1951).

¹¹⁰ See the conclusions and recommendations of Commissioners Smith and Wimberly, FPC INVESTIGATION OF THE NATURAL GAS INDUSTRY 1-29 (Docket No. G-580 1947), and Staff Report, *State Conservation Laws and Activities in id.*; UNITED STATES NAT. RESOURCES COMM., ENERGY RESOURCES AND NAT. POLICY 215-36 (1939).

¹¹¹ This type of encouragement or coercion of the states to enact conservation laws was suggested by President Roosevelt in a letter to Representative Cole in 1940. See *Hearings, supra* note 22, at 2169.

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