Kansas Legislative Research Department September 16, 1977

M I N U T E S

SPECIAL COMMITTEE ON ENERGY

August 22-23, 1977

Members Present

Representative Donald E. Mainey, Chairman
Senator Arnold Berman
Senator Bill Morris
Representative August Bogina
Representative Tim Holt
Representative J. Littlejohn
Representative Robert H. Miller
Representative Charles J. Schwartz

Staff Present

Ramon Powers, Kansas Legislative Research Department
Mary Torrence, Revisor of Statutes Office

Conferees Present

Janice Johnson, Kansas Energy Office
Lawrence L. Brady, Kansas Geological Survey
R. G. Hardy, Kansas Geological Survey
Richard Snyder, Kansas Corporation Commission
Walter Dunn, Eastern Kansas Oil and Gas Association
Don Schnacke, Kansas Independent Oil and Gas Association
R. D. Randall, Kansas Independent Oil and Gas Association
Bernard E. Nordling, Southwest Kansas Royalty Owners Association
Richard Jones, Anadarko Production Company
Earl Evan, Farmland Industries
Lane Harold, Farmland Industries
Randy Fricke, Nebraska Agricultural Products Industrial Utilization Committee
Dr. Floyd Shoup, Director of Research and Development, FAR-MAR-CO, Inc.
Representative Dean Shelor, Minneola, Kansas
Myron Krenzin, Kansas Wheat Commission
Senator Loran Schmit, Nebraska
Tom Dean, K.U. School of Architecture
Vincent Tengeman, Mid-America Coalition for Energy Alternatives
Mel Gray, Director, Division of Environment, Department of Health and Environment
Ron Miller, Energy Resources Group, Cities Service Oil Company
Professor G. Paul Willhite, Coordinator, Tertiary Oil Project, University of Kansas
Don Green, Coordinator, Tertiary Oil Project, University of Kansas
Steve Blake, Oskaloosa, Kansas
Gary Thomann, Wind Energy Laboratory, Wichita State University

Morning Session

Chairman Mainey called the meeting to order at 9:30 a.m. Committee members were furnished copies of revised agendas for the meeting on Proposal No. 21 - Energy Research and Production.

Chairman Mainey introduced Janice L. Johnson, of the Kansas Energy Office. Preceding her presentation, Miss Johnson reported to Committee members that Kansas did not receive an ERDA award for the Kansas Energy Extension Service. Miss Johnson had presented a report of this application for the grant to the Committee during their July meeting.

Miss Johnson furnished Committee members with Kansas Energy Fact Sheets and three data sheets on natural gas flow patterns, copies of which are attached (Attachment 1). In testimony on Kansas Energy Production and Patterns, she discussed Kansas' three primary resources - crude oil, gas and coal. She stated that Kansas is still a net energy exporter.

Miss Johnson pointed out the steady decline of natural gas reserves and reported 1975 statistics showing approximately 37 percent of Kansas natural gas production supplies Kansas natural gas needs, while the bulk of the remainder of the gas produced in Kansas mainly goes to thirteen other midwestern states. On the consumption side, 48 percent of the gas consumed in Kansas originates in other states - principally Texas and Oklahoma.

Miss Johnson described Kansas as a "mature", or stripper well, state with oil production and reserves showing parallel declines for the past two decades. She reported that, in 1976, stripper well production provided 75 percent of total oil production of the state. (Average daily production per Kansas well is shown at 3.8 barrels, as compared with the national production of 16 barrels per day per well, and the Saudi Arabian average production of 12,225 barrels per day per well.) She reported Kansas crude oil refinery capacity at its highest level in history, with Kansas produced oil supplying only 37.5 percent of Kansas refiners' crude oil requirement base.

Although Kansas has a large coal resource, Miss Johnson said that the state has a comparatively small production due to past slack demands, environmental regulations, and the nature of our coal resource, with thin seams and high sulfer and ash content.

Miss Johnson also pointed out the change in Kansas electric industries, where, in 1972, 90 percent of the electricity generated was produced by means of gas, but in 1975 only 58 percent of this electricity was produced using natural gas as a fuel.

In discussing energy consumption in Kansas, Miss Johnson described the steady pattern of increased use until 1975 when a decline pattern followed. She stressed the importance of natural gas to the Kansas economy. from 1965 to 1974, gas supplied approximately two-thirds of Kansas energy requirements. This dependence on gas is being reduced because of necessity.

Discussing distribution of energy in Kansas, Miss Johnson reported that the transportation sector accounts for 29 percent of consumption, the industrial sector 56 percent, the electric utility sector 18 percent, and the agricultural sector 7 to 10 percent.

In answer to Committee members' questions, Miss Johnson expressed the opinion that, with the utility companies shifting from the use of natural gas to coal, total consumption of natural gas will probably continue on a downward pattern.

Chairman Mainey thanked Miss Johnson for her presentation and introduced Lawrence L. Brady, of the Kansas Geological Survey. Dr. Brady's testimony on "Kansas Coal Resources and Production" is attached (Attachment 2). This presentation was supplemented with slides.

Dr. Brady told the Committee that Kansas coal resource is estimated at 22.7 billion tons, representing about 0.5 percent of the total coal resource of the United States. However, Dr. Brady said, only a small portion of Kansas coal resource will be developed without significant changes in present methods of coal extraction. Limitation on use of this resource is due to the occurrence of coal as thin beds. It is anticipated that, due to the thin beds in Kansas, future mining will be primarily by strip mining methods. Dr. Brady reported the strippable coal reserve base in Kansas to be 526 million tons, with an additional 800 million tons which can be potentially mined. Future mining in Kansas will probably be concentrated in three counties, Cherokee, Crawford and Linn, which contain 66 percent of the strippable reserve base, with additional mining in Bourbon and Osage counties.

Dr. Brady said Kansas coal production will continue to increase due to increased demands by industry and power companies. However, this production will be curtailed somewhat by the influx of western coal meeting the larger demands for coal in the state. When questioned regarding the Kansas deep coal reserves, Dr. Brady said these reserves are of high sulfer content, but the heat value is very good.

Chairman Mainey then introduced R. J. Hardy of the Kansas Geological Survey to present testimony on the Kansas Mined Land Reclamation Act. A copy of Mr. Hardy's statement is attached. (Attachment 3).

Mr. Hardy described reclamation project methods. He showed slides which included typical areas of strip-mined land, methods of reclamation of strip-mined land, and methods of infrared aerial photography which show areas of land suitable for growth and areas not useful for agriculture.

Mr. Hardy reviewed the key provisions of the Kansas Mined Land Conservation Act. He reported that, in 1976, the 576,000 tons of coal produced in Kansas required the reclamation of approximately 200 acres of land.

Mr. Hardy pointed out the important differences between Kansas regulations and the new federal Surface Mining Control and Reclamation Act, and directed the Committee's attention to the state procedure and time-table in the federal act for obtaining an approved state regulatory program. He emphasized the need for more stringent Kansas regulations in order to comply with federal requirements to avoid the implementation of a federal program in Kansas.

Answering questions of Committee members regarding requiring the replacement of top-soil, Mr. Hardy expressed his personal opinion that in some instances there are other replacements which work better than top-soil, and that this decision should be left to the operator. The question of land unreclaimed prior to the time reclamation laws became effective was raised, and Mr. Hardy explained that property owners wanting land reclaimed can apply to the federal government for reclamation on a cost-sharing basis (approximately 90 percent of the cost to be paid by government), but that some people do not take advantage of this opportunity.

Richard Snyder, attorney for the Kansas Corporation Commission, was introduced by Chairman Mainey. Mr. Snyder's testimony dealt with the federal power commission's natural gas order affecting Cities Service Company. Mr. Snyder noted that the original FPC order did three things: (1) changed the priority of certain uses of gas; (2) prohibited load growth; and (3) established an equalization provision which allowed the FPC to exercise burner tip control. On July 8, the KCC filed an application for rehearing, and, at about the same time the Sweet Lumber Company of Kansas, City, Kansas went to court to enjoin the FPC from enforcing its order. In its filing the KCC argued that the FPC erred in assuming that the gas supply of Cities Service would deteriorate, and that the FPC jurisdiction could not extend to burner tip control. On August 2, 1977, the court granted a rehearing on two issues: (1) the need for an environmental impact assessment on high priority users; and (2) the issue of new gas reserves and load growth of Cities systems.

When questioned, Mr. Snyder said that the date has not been set for rehearing the matter, but that he would expect it to be during November or December, and that the prohibition of additional hook-ups has been suspended.

Following a brief recess, Chairman Mainey introduced the next topic of hearings - a review of unitization, as proposed in S.B. 420. Committee members were furnished copies of S.B. 420. The Chairman then introduced Richard Jones, of Anadarko Production Company, Wichita, Kansas, who presented a statement prepared by Jack Glaves of Panhandle Eastern Pipeline Company, Wichita, Kansas, on unitization of oil and gas leases. A copy of this statement is attached (Attachment 4).

Mr. Jones stated that, in general, it is believed by his industry that this sort of legislation is for the benefit of the people of Kansas. He said that Kansas, Nebraska and Texas are the only states which do not have this type of pooling law. He explained that the basic proposition of a pooling law is the encouragement of exploration and development, and that this type of legislation assures the state of full exploration.

Mr. Jones emphasized the need in Kansas for a well spacing law, important because of insuring everyone of fair participation. He said that with closely spaced wells, investors have difficulty recovering investments. He also recommended that the law give the Kansas Corporation Commission broad authority to establish wide spacing with location restrictions.

Secondly, Mr. Jones recommended a compulsory pooling or unitization law. Such laws should be tailored to Kansas needs, and would result in (1) more drilling and increased exploration, (2) return of greater revenue to the state, and (3) more energy for Kansans.

In discussion with Committee members regarding the language of S.B. 420, Mr. Jones expressed his opinion that well spacing should be clearly defined, with authority given to the Kansas Corporation Commission.

Chairman Mainey introduced Walter Dunn of Eastern Oil and Gas Association. Mr. Dunn stated briefly that his association was opposed to S.B. 420. He stated that a member of his association was scheduled to be present and give testimony, but he had not appeared.

The next conferee, Don Schnacke, representing Kansas Independent Oil and Gas Association, was introduced by the Chairman. Mr. Schnacke reminded legislators that there had already been a number of production-incentive bills introduced as well as some which were pending at the present time. He said that the Board of Directors of KIOGA is divided on S.B. 420, and that the industry is not whole-heartedly in support of the bill. He cited as objections: (1) the state mandating in areas where companies now act voluntarily; and (2) increased expense for the Kansas Corporation Commission in the area of small operators.

Mr. Schnacke introduced R. D. Randall, attorney for KIOGA, who also presented testimony in opposition to S.B. 420. Contrasting Kansas with Oklahoma, Mr. Randall pointed out that at this time the problems do not exist in Kansas as contrasted with Oklahoma where there is a much more active industry involving higher stakes. He also said that the operators and landowners are more cooperative in Kansas. He questioned whether it was too late for forced pooling legislation, considering the lack of consensus in the industry, and the cost of additional Corporation Commission staff required which would eventually result in higher costs for consumers.

In reply to Committee members' questions as to who opposed pooling legislation in 1963, Mr. Randall said it was the independent sector of the industry. It was also suggested that proponents and opponents should work on a bill which would be satisfactory for all.

Chairman Mainey then introduced Bernard E. Nordling, of Hugoton. Mr. Nordling furnished Committee members with the following materials: H.B. 2002; Attorney General Opinion No. 77-29; Memorandum of Law to the Judiciary Committee of the Kansas House of Representatives Re: Bill No. 2002; Statement of B. E. Nordling to Kansas House Judiciary Committee; Memorandum of Law in Response to Attorney General Opinion No. 7729; Statement of B. E. Nordling to Kansas Special Committee on Energy; Tabulation of Unitized Gas Wells - Stevens County, Unitization; K.S.A. 55-1301 through 1315; S.B. 420; S.B. 307; Statement of R. Larrabee to Senate Committee on Conservation and Natural Resources; and Summary of Pooling Laws of Oil and Gas Producing States. (These materials are on file in the Kansas Legislative Research Department.)

By way of introduction, Mr. Nordling said that he was also a member of the Kansas Energy Advisory Council, although his testimony was made as Secretary of the Southwest Kansas Royalty Owners Association (SWKROA). Mr. Nordling said that SWKROA is a non-profit organization of over 2,000 landowner-lessors owning mineral interests in the Hugoton field in southwest Kansas.

Mr. Nordling expressed his Association's opposition to S.B. 420, and directed Committee members attention to H.B. 2002, now pending before the House Judiciary Committee, which, he said, had been introduced to encourage exploration and development. Mr. Nordling reviewed the history and development of the Hugoton field and stated that in 1976, Dr. W. J. Ebanks, of Kansas Geological Survey, said that prospects for "deeper" field discoveries in the Hugoton field are good, with 23 producing formations below the shallow Hugoton gas zone.

Mr. Nordling said that much of the land in the Hugoton field is held under oil and gas leases executed thirty to forty years ago, and although engineers and geologists indicate the deeper horizons hold large reserves of oil and gas, they are still unexplored and undeveloped. Although royalty owners urge lessees to explore the deeper horizons, the lessees have preferred to spend their funds searching for oil and gas in other states, the North Sea, offshore, or in foreign countries, instead of drilling in the Hugoton area. Mr. Nordling stressed that the development of the Hugoton field had been orderly, with good spacing patterns, due to cooperation between lessees, royalty owners and the Kansas Corporation Commission working together voluntarily, and without the need for compulsory pooling or unitization.

Mr. Nordling emphasized his association's main objections to S.B. 420 which is that the bill takes away land-owners' rights and economic benefits they should have under oil and gas lease contracts, including the right to negotiate lease terms and lease bonuses, the right to negotiate for drilling of wells or additional development, or the right to refuse to lease land for oil and gas purposes for personal or business reasons.

Mr. Nordling directed the Committee's attention to the summary furnished on pooling legislation and suggested that the Texas bill was the best legislation. He commented that the Oklahoma bill gives landowners no chance to protect their rights.

In conclusion, Mr. Nordling said that S.B. 420 is not an acceptable bill, and if it is to be considered, it should be completely revamped and redrafted to protect the rights of all groups, and should be patterned after the Mineral Interest Pooling Act of Texas.

Following Mr. Nordling's testimony, Robert Anderson of Ottawa, Kansas, stated that he would like to present testimony opposing H.B. 2002 if the Committee would hear testimony on H.B. 2002. Chairman Mainey said that the Committee would not be holding hearings on H.B. 2002.

Afternoon Session

The Committee reconvened at 1:30 p.m., for continuation of hearings on incentives for energy production in Kansas. Announcing a change in the agenda, the Chairman introduced Tom Dean of the Kansas University School of Architecture.

Dr. Dean described the problem of design of solar systems, saying that at this time most solar engineers and solar architects do not have the expertise to design a total solar system. He warned that many solar designs being sold today will not do what the seller claims, and will not meet standards people expect. He warned of opportunistic solar salespersons taking advantage of the many citizens becoming interested in solar installation, with the result being many poor installations of equipment that will not produce up to sales claims. A cadre of persons who can develop and design solar systems is being trained at the University of Kansas, Dr. Dean said.

Dr. Dean cited the retrofit problem as a crucial problem. He said there was a great need to get information to contractors who are doing the solar installation work. Dr. Dean has proposed to the University administrators that an information and dissemination center be established at the University of Kansas to saturate the state with solar information. He also suggested that the legislature forbid new gas connections, and raise the $1,000 state tax rebate for solar energy system installations.

Following his presentation, Dr. Dean was asked about the utility costs in his own solar home in Lawrence. Dr. Dean stated that his expense for January, 1977 was $11 for heating space and $12 for water heating. In answer to questioning regarding the problem of sales of substandard solar equipment, Dr. Dean restated his belief in the effectiveness of programs of education at the graduate and undergraduate levels, continuing education programs for those in the field, and an information center at K.U. He said the Kansas Consumer Protection Act might, to some degree, help buyers of systems, but many buyers will be "burnt" in the process.

A copy of Dr. Dean's paper on solar assisted heat pumps, which he presented in London, was furnished to Committee members. (A copy of that paper is on file in the Kansas Legislative Research Department.)

Chairman Mainey thanked Dr. Dean for his appearance before the Committee and introduced Randy Fricke of Nebraska Agricultural Products Industrial Utilization Committee (APIUC), as the first conferee for the Gasohol portion of the hearing. Mr. Fricke furnished Committee members with copies of the brochure, A Summary of Gasohol, which is attached (Attachment 5). Mr. Fricke's testimony dealt with the Nebraska Gasohol program. In connection with his remarks, Mr. Fricke showed slides to Committee members.

Production of Gasohol (a blend of 10 percent agriculturally derived ethyl alcohol and 90 percent unleaded gasoline) has been successful in Nebraska, Mr. Fricke told the Committee members. He reported that gasohol tests, conducted with Nebraska Department of Roads and Vehicles, have shown that gasohol is a more efficient fuel than gasoline, with consumption of gasohol at about five percent less than that of unleaded gasoline, and causes no problems such as unusual wear or carbon build-up.

Mr. Fricke said that in order to make gasohol available to the people, the APIUC wants to build one or more grain alcohol plants - each plant to produce twenty million gallons per year at a capital investment of $21 million per plant. When asked about the technology of blending the alcohol and gasoline, Fricke said it was a simple blending which can be done at any refinery or even at a service station. Questioned about the petroleum industries' cooperation with the gasohol program, Mr. Fricke said they certainly were interested in any way to extend fuel supplies, and that they attend meetings and observe state legislation in this area.

Mr. Fricke introduced Nebraska State Senator Loran Schmit, who originally introduced the Nebraska gasohol legislation. Senator Schmit stressed the importance of the gasohol program as one answer to the fuel shortage, and to the age-old problem of farmers finding markets for excess grain. He said that he believed that the economic stability of the midwest depends on the market for grain and grain products, and that farmers cannot wait on the federal government to find answers in this area. Mr. Fricke also said that his committee in Nebraska was now working with the Federal Energy Administration to establish standards for gasohol.

It was noted by Committee members that the petroleum industry may be reluctant in the area of development of gasohol because of economic reasons. It was also noted that legislation may be required mandating a distribution system of gasohol for an effective program.

The Chairman introduced Dr. Floyd Shoup, of FAR-MAR-CO, Inc. Dr. Shoup stated that production of gasohol in Kansas is not commercially feasible at this time. He said that it would be redundant for Kansas to take on a gasohol project when the project is being done in Nebraska. He expressed concern about creating markets and improving markets for excess wheat, but he feels that research projects on wheat by-products and their recovery in their most valuable form is most important in making the production of wheat more profitable. Dr. Shoup said that selling starch to the paper industry and wheat bran and gluton to the food industry are the better methods of creating markets for excess wheat in Kansas.

Chairman Mainey then introduced Earl Evans, of Farmland Industries. Mr. Evans told Committee members that Farmland Industries has been encouraged to get into the gasohol business, but at this time it does not feel that production of gasohol would be economically feasible.

Lane Harold, manager of Farmland Industries' Engineering Research Department, was introduced. Mr. Harold said his company had been studying gasohol for ten years, and the historic and underlying problem is that of economics - the technical problems can all be overcome. He said that even with the rise of gas prices since the oil embargo, his company still does not feel gasohol is economically feasible considering the costs of distribution and plant construction. He said that any new plant constructed would be a "loser". He also said Farmland Industries is pessimistic about the cost of capital needed for financing the construction of grain alcohol plants, as well as the marketability of the grain by-products resulting from the manufacture of alcohol.

Mr. Harold did agree with Committee members who questioned whether laws of profit and loss can apply to the production of energy. It was also agreed that converting wheat to alcohol would be more attractive if government became involved in funding gasohol plants. The question of the constitutionality of requiring petroleum companies to distribute gasohol was raised. Chairman Mainey thanked all the conferees for their presentations on gasohol.

Following a short recess, Chairman Mainey introduced Representative Dean Shelor of Minneola, Kansas. Representative Shelor reminded Committee members of the United States' dependance on foreign markets for gas supplies, of the agricultural depression existing in western Kansas at this time, and of the urgency of finding markets and other uses for excess grain. He advocated immediate consideration by the legislature of action in this area, rather than waiting until years later.

Myron Krenzin, of the Kansas Wheat Commission, was introduced by Chairman Mainey. Mr. Krenzin furnished Committee members with: a copy of the Kansas Wheat Commissions Annual Report to the Governor; a Report on Ethanol that appeared in Chemical Week; Evaluation of Grain Alcohol as a Motor Fuel by the State of North Dakota; Kansas Grain and Feed Dealers' Association Bulletin, Report on Whole Wheat Fractional Process; U.S. Department of Agriculture Report on Ethanol Fermentation; and copies of newspaper articles on gasohol from the Kansas City Times, Farmer Stockman of the Midwest, and the Sunday Oklahoman. (Copies of these materials are on file in the Kansas Legislative Research Department.)

Mr. Krenzin stressed the importance of avoiding another oil embargo crisis. He reminded Committee members that Kansas is primarily an agricultural state, with the economy dependent on the price and markets for wheat. He stated that there is a five million bushel wheat reserve in the state this year. He expressed his Commissions' eagerness to work with state legislators on ways to inaugurate gasohol production in Kansas. He said the Commission had sent questionnaires to oil companies regarding gasohol, and the possibility of reducing their business by 10 percent, and the oil companies had responded negatively. He stated that the recent problems encountered by Nebraska in connection with their gasohol program were probably originated with the oil companies.

Chairman Mainey thanked Mr. Krenzin for appearing before the Committee, and he expressed his surprise that such strong stands were taken on the gasohol issue.

Chairman Mainey introduced Vincent Tengeman of Centralia, Kansas. A copy of Mr. Tengeman's statement is attached (Attachment 6). Mr. Tengeman explained that he as a farmer, and had been requested by the Mid-America Coalition for Energy Alternatives to present testimony on Methanol. He reported on attachments he uses on his car and truck which inject alcohol into the carborators. The result is increased gas mileage, less pollution, and a cleaner engine. He is currently concerned with developing a project on his farm to save energy. He cited the use of Methanol in Scandanavian countries, during World War II in Germany, and in other countries around the world. Chairman Mainey thanked Mr. Tengeman for his presentation. The meeting was recessed for the day.

August 23, 1977

Chairman Mainey called the second days' meeting to order at 9:00 a.m., and introduced Ron Smith, Kansas Legislative Research Department, to review the memorandum on "Gasohol and its potential for development in Kansas", prepared for the Committee by the Kansas Legislative Research Department. A copy of the memorandum is attached (Attachment 7). Mr. Smith briefly reviewed the background of gasohol, the experience of the Nebraska gasohol program, federal legislation now pending, the Montana, Minnesota and Wisconsin legislation concerning gasohol, and the general feasibility and problems in the production of gasohol.

It was requested that the staff check the constitutionality of requiring petroleum distributors to sell a certain percentage of gasohol with their own products. Discussion followed regarding the problems in such a plan unless it were instituted nationally. It was noted that Senator Schmit of Nebraska had advocated that states act individually until the federal government acts. The issue was then raised as to the importance of the economic feasibility of such a program in light of energy problems and the problems in the agricultural sector (i.e., the need to use surplus grains).

Chairman Mainey introduced Mel Gray, Division of Environment of the Department of Health and Environment to present testimony on the environmental impact of energy production. Mr. Gray stated that Kansas has been a leader in the control of brine (wastes in oil production); the state controls disposal of one and three-fourths billion barrels of brine annually. He discussed new federal legislation and its effect in Kansas. He said there will be substantial cost increases in water pollution control; injection well permits must be reviewed every five years, and there are more stringent

requirements on input wells (causing $12,000 to $15,000 additional cost, and eventually higher costs).

Mr. Gray discussed the problem of disposal of fly ash generated by coal fired power plants to avoid contamination of water and air, and the costly processes of monitoring Kansas power plants.

The 1977 Legislature enacted a hazardous waste law which will aid in the protection of the environment. This act, according to Mr. Gray, will put the state in compliance with federal hazardous waste standards. Kansas is well ahead of other states in this regard, he noted.

In response to questioning, Mr. Gray stated it is his philosophy that the Division of Environment is charged with assuring Kansans of a safe environment. In the situation of degraded environment against substantive costs, Mr. Gray said he feels that individuals must be forced to add corrective equipment or the Division would have to secure injunctions to stop operations.

There followed a series of questions concerning the Division of Environments' granting of a variance to Empire District Electric Company's Riverton Plant delaying their compliance with state air quality standards. Mr. Gray admitted that the Division did not provide for proper notice in local newspapers of hearings on the variance. The problem of the three year "snow fall" from the fly ash was raised. Mr. Gray noted that no hazard was involved and no complaints made until last fall. There was no violation of emission control standards. The plant was put on a time table to take care of the problem as it is ahead of schedule.

The variance granted on the Riverton Plant was concerning sulfer dioxide. The question was asked, why was a ten year variance granted? The problem is in the purchase of equipment to take care of the problem; such equipment is in great demand and higher priority was given to requiring pollution control equipment on the main Empire District Plan located immediately across the state line in Missouri and other large plants throughout the country, Mr. Gray stated. The variance is for emission standards only and the companies must meet ambient air quality standards Mr. Gray insisted.

When asked if the Division could shut down a plant that did not meet standards, Mr. Gray stated that it requires a court order to do that. Closure cannot be effected without due process, he noted.

The problem of oders was discussed, and Mr. Gray admitted that he and his staff were not aware until recently that they can enforce oder standards.

Following a short recess, Chairman Mainey introduced Ron Miller, Energy Resources Group, Cities Service Oil Company, to present testimony on the El Dorado Micellar - Polymer Enhanced Oil Recovery Project.

Mr. Miller showed Committee members slides illustrating tertiary oil recovery methods in connection with his remarks. He told the Committee members the objectives in the El Dorado project are: (1) to establish if tertiary oil can be recovered using micellar-polymer techniques; (2) to determine data and results to evaluate if commercial oil recovery is practical (even though El Dorado Project is very expensive and will probably be a "loser"); (3) to interpret data; and (4) to make data and results available to the public.

Mr. Miller discussed the uncertainties and advantages of the project. He also explained the technical process used in tertiary oil recovery, and the way this process forces the residual oil out from the injection wells to areas where it can be recovered by recovery wells. He said production is anticipated by 1978, with a peak production in 1981 -1982. The estimated cost of the project is $13 million or $21 per barrel. Costs are funded by Energy Research and Development (40 percent) together with Cities Service funding.

Following his presentation, Miller was questioned as to the effect of chemicals used in oil recovery on water supplies. He stated that these fluids are confined to a particular zone, and the project is complying with requirements and regulations of KCC.

The Chairman then introduced Professors G. Paul Willhite and Don Green, coordinators on tertiary oil project at Kansas University.

Professor Green used slides to supplement the presentation on the K.U. project. He explained that the three year old project is staffed by several fulltime employees and student help. The objectives of the project are threefold:

1. evaluation of potential of tertiary process in Kansas;
2. research and development of tertiary recovery methods; and
3. dissemination of information on the oil recovery process.

He reported that a reasonable estimate of possible tertiary oil recovery in Kansas is two billion barrels, which is five times our current reserve.

Professor Green said the project work focuses primarily on processes which will be meaningful to Kansas and Kansans, and that all data and research information is fed into the Department's computer for compilation.

Professor Green emphasized that one of the main objectives of the program is to gather information and get it to Kansas industry, especially since much of Kansas oil is in the independent sector and research on such an expensive recovery process is too expensive for the independents to undertake.

Mr. Green reported on tertiary oil recovery classes introduced in the graduate program at K.U. and planned programs at the undergraduate level. When Mr. Green was asked if an extension education service might be planned in this field, he said that at this time resources and staff are unavailable for that kind of program, but he believed it was a worthwhile idea.

Mr. Green also explained that most of the program financing was from state funding, except for $5,000 annually provided by Phillips Petroleum.

Professor Willhite emphasized the dwindling oil production projected for the future through conventional recovery methods. He said that North Slope Alaskan production can only offset this crisis in a very small way, therefor research and development in enhanced oil recovery will be a significant factor in a solution to the energy crisis.

He stated that enhanced oil recovery could add between 11 and 29 billion barrels of oil to U.S. oil reserves, and, that a vigorous program of research and development with many field tests will be necessary for achieving significant enhanced oil recovery production. He also stated that decontrolling the price of oil produced by enhanced oil recovery techniques would reduce the risk and increase potential production more than any alternative tax or price policies examined.

The Chairman introduced Steve Blake of Oskaloosa, Kansas, to present testimony on wind energy research. Mr. Blake said that he had been active in wind industry since 1972. He described wind as a "benign power source". He said that a federal government wind research project was begun in 1973, with the objective of reducing costs of energy. He noted that the uncertainties involving air currents and siting of wind systems as the two main problems of research. He said that recent interest in wind systems is focusing on small wind systems, and that the government is interested in developing smaller systems which can be sold at lower prices people can afford.

Mr. Blake used slides to show maps illustrating wind power across the United States, which revealed that the second best area for wind in the country includes southwest Kansas.

Answering Committee members questions regarding the use of wind power for residential use, Mr. Blake said that within the next two years many advances will be made in the development of small wind systems, and that with back-up power of another source, wind will be useful as a power source for residences. Mr. Blake recommended load management by utilities to increase the power capacities of their system as a solution to energy problems. He reminded Committee members of the success telephone companies have had using off-peak pricing incentives.

Afternoon Session

The afternoon session was called to order at 1:45 p.m. by Chairman Mainey. Representative Schwartz made a motion that the minutes of the July 11-12 meeting of the Special Committee on Energy by approved. The motion was seconded by Senator Berman, and was voted upon favorably.

Chairman Mainey asked that the Committee consider a two-day meeting in addition to the previously planned schedule of meetings for the interim period. It was noted that a request for the additional meeting dates must be made to the Legislative Coordinating Council. Following Committee discussion it was agreed to request approval for an additional meeting of the Committee on November 3 and 4, and a change of schedule from the scheduled meeting of November 10 and 11 to November 9 and 10.

Chairman Mainey introduced Gary Thomann, of Wichita State University, to make a presentation on work being done at the Wichita State University on wind research. Professor Thomann showed slides in connection with his presentation. He said the University has received state funding for this research since 1974. He reported that the Wind Energy Laboratory is staffed by both electrical and aeronautical engineers.

Professor Thomann said investigation is concentrated on: (1) large and small wind turbines for the generation of electricity, and (2) compiling of wind statistics and data in western Kansas (with special emphasis on optimum siting for wind generators). He reported that expenditures have been $50,000 to $55,000 annually, and that an appropriation of $60,000 is anticipated this year.

Professor Thomann described methods of compiling wind characteristics and making site selections. Future plans, Professor Thomann said, include continuing research on wind generating farms, studies of the value of wind potential for the state in private application (including irrigation by wind power), and, creating coordinating and advisory councils to coordinate work being done across the state.

Professor Thomann furnished the Committee members with copies of Wind Energy Laboratory Reports. A copy is attached (Attachment 8).

During Committee discussion following the hearings, Senator Morris commented on the prevalent confusion among citizens of the state regarding the present energy crisis. Basically, Senator Morris argued, people want something done about $150 utility bills. He also questioned solar and wind innovations becoming obsolete in a short period of time. It was noted by Chairman Mainey that many persons eligible for cash grants to pay high utility bills did not apply for the grants. Senator Berman stated that the most immediate effects to be achieved were by thermal insulation of homes. Representative Littlejohn noted that many cannot afford insulation programs.

Representative Holt suggested that people do not believe there is a real energy crisis, and that an education program would be a step in the right direction. Chairman Mainey said that it may be that economics is the only way people can actually be educated. The possibility of utilities providing financing for individual insulation programs with the state subsidizing the interest was discussed.

It was suggested that time-of-day pricing would be one solution, and Committee members discussed whether or not it was in the state's domain to legislate in this area. Chairman Mainey said the Committee's next meeting would include hearings on time-of-day rates.

Committee discussion turned to the subject of gasohol and Senator Berman made a motion that the Chairman appoint a subcommittee to be composed of members of the Committee to develop a bill concerning gasohol and report back to the Committee. Representative Holt seconded the motion.

During Committee discussion regarding the motion, Senator Morris said he was opposed to the subcommittee concept. The motion was voted upon and failed to pass.

During further discussion on gasohol, Representative Schwartz said he would like to see the Committee do further investigation in this area. Representative Holt agreed that he did not want to see the Committee dismiss the subject at this time. Representative Miller commented that all testimony on gasohol had shown gasohol not to be economically feasible. Representative Bogina questioned duplicating Nebraska's research and stated that he believed that industrial ethanol markets were a better answer than gasohol.

Senator Berman pointed out that if the state motor pool of 2,000 vehicles used gasohol, it would make a significant impact.

Chairman Mainey announced the September meeting would include hearings on CWIP and Rate Structures. Senator Berman moved the meeting be adjourned. The motion was seconded and the Committee voted to adjourn.

Prepared by Ramon Powers

Approved by Committee on:

9/22/77
(Date)

Attachment

KANSAS ENERGY FACT SHEET

Prepared for the

Special Committee on Energy

by

Janice L. Johnson

Kansas Energy Office

August 22, 1977

KANSAS ENERGY RESOURCES:

ESTIMATES OF RESERVES, PRODUCTION, & ECONOMIC VALUE

	1976 Reserves (Btu's)	1976 Production (Btu's)	1976 Value of Production	Average First Cost Per Million Btu's
Oil	2.05×10^{15}	333×10^{12}	$616.5 million	$1.85
Gas	11.95×10^{15}	829×10^{12}	277.6 million	.33
Coal	11.57×10^{15}	14×10^{12}	11.5 million	.82
Totals	25.57×10^{15}	1176×10^{12}	$905.6 million	$ .77

Kansas Consumption to Production Ratio: Approximately 3:4

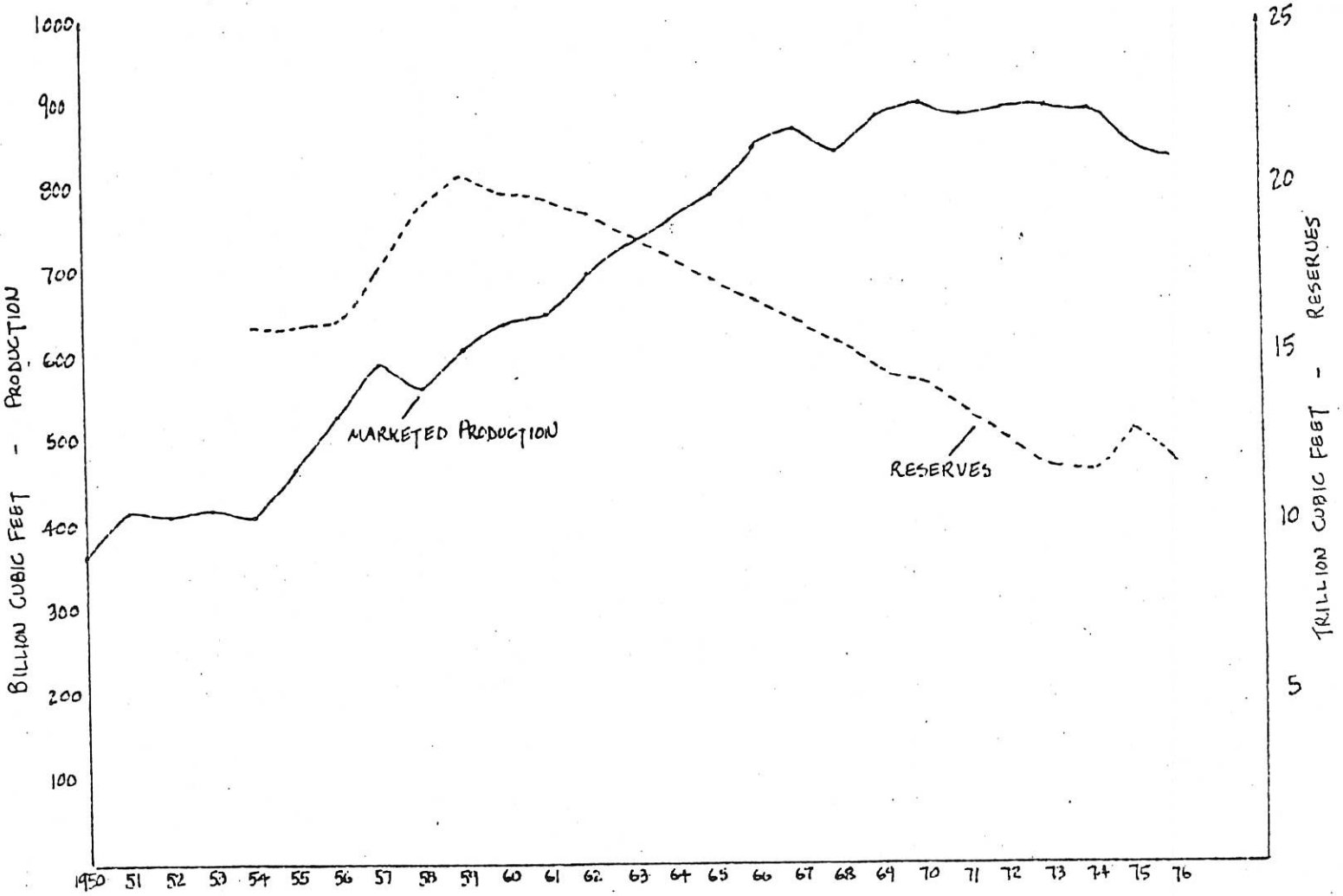
NATURAL GAS

YEAR	END OF YEAR RESERVES (Bcf)	MARKETED PRODUCTION (Bcf)	RESERVE/ PRODUCTION RATIO
1976	11,951	829	14.4
1975	12,661	843	15.0
1974	11,705	889	13.2
1973	11,722	897	13.1
1972	12,535	894	14.0
1971	13,325	890	15.0
1970	14,125	904	15.6
1965	17,278	807	21.4
1960	19,981	675	29.6

Average Wellhead Price, 1976:	33.2¢ per Mcf
Value of Production, 1976:	$277.6 million
Number of Producing Gas Wells, 1976:	9,330

Reserves, Natural Gas Liquids, Jan. 1, 1977:	388 million barrels
Number of Gas Processing Plants, 1977:	29
Total Capacity of Gas Processing Plants, 1977:	5520.5 MMcfd
Average Gas Throughput, 1976:	4369.9 MMcfd
Natural Gas Liquids Production, 1976:	30.2 million barrels
Value of Natural Gas Liquids Production, 1976:	$114.4 million

Data Sources: U. S. Bureau of Mines; Kansas Geological Survey; Kansas Corporation Commission; Oil and Gas Journal



KANSAS MARKETED GAS PRODUCTION & END OF YEAR RESERVES
(psia 14.73)

SOURCE : U.S. BUREAU OF MINES

CRUDE OIL

YEAR	END OF YEAR RESERVES (1,000 Bbls)	PRODUCTION (1,000 Bbls)	RESERVE/ PRODUCTION RATIO
1976	361,570	58,714	6.2
1975	364,394	59,108	6.2
1974	395,107	61,692	6.4
1973	401,089	66,227	6.1
1972	453,394	73,744	6.1
1971	501,552	78,532	6.4
1970	539,305	84,812	6.4
1965	751,629	104,733	7.2
1960	883,849	113,453	7.8

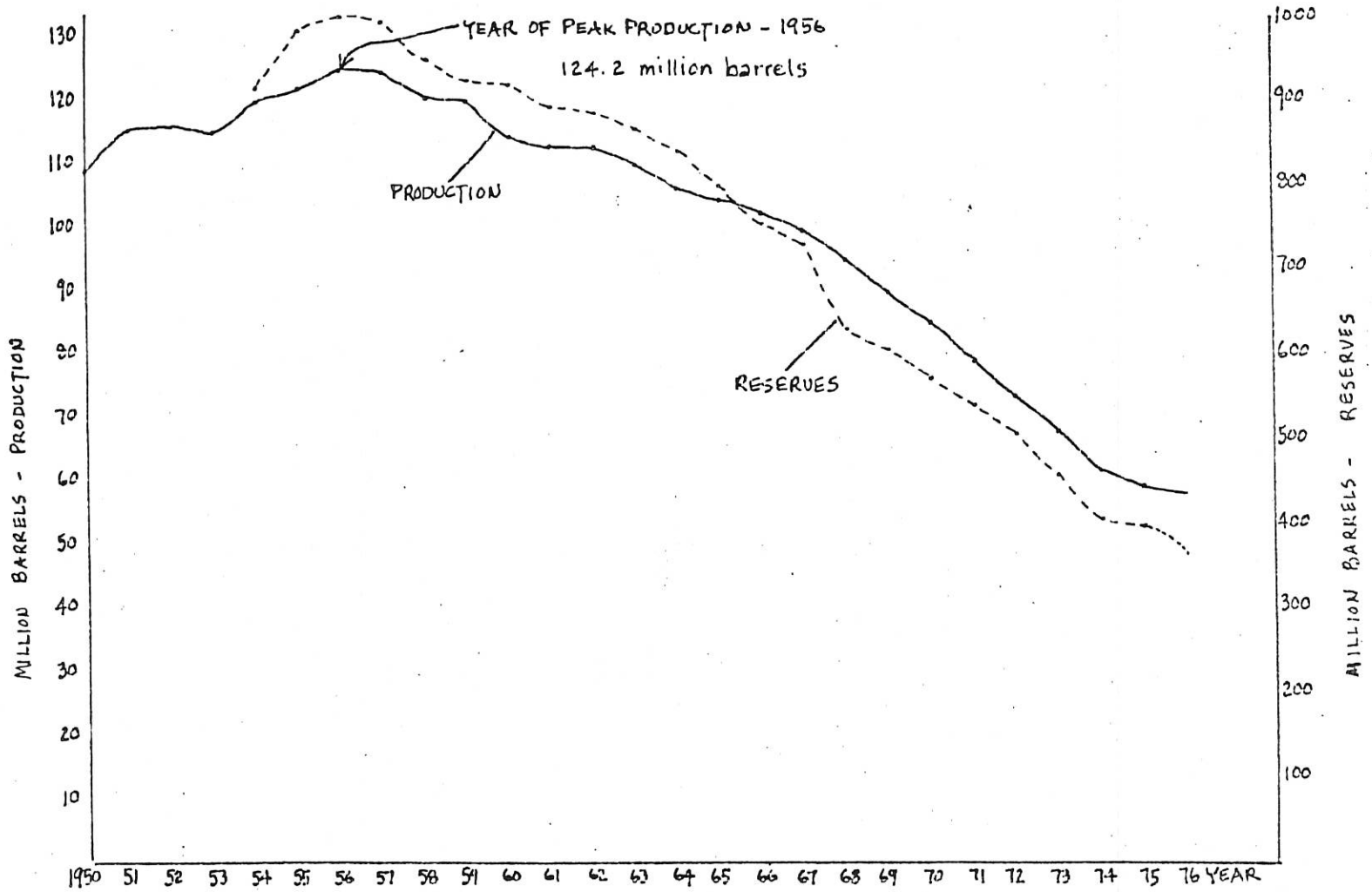
Total Oil and Gas Wells Drilled, 1976: 3,977
Total Wildcats Drilled, 1976: 914
Total Footage Drilled, 1976: 11.9 million
Dry Holes as Percent of Total Wildcats, 1976: 81.2%

Average Wellhead Price of Crude, 1976: $10.50 per barrel
Value of Production, 1976: $616.5 million

Number of Producing Oil Wells, 1976: 42,240
Number of Stripper Wells, 1976: 41,837
Stripper Well Production as Percent of Total, 1976: 75.8%
Average Daily Production Per Well, 1976: 3.8 barrels

Crude Oil Capacity of Operating Refineries, 1977: 459,593 barrels per day
Total Crude Oil Processed, 1976: 145.6 million barrels
Origin of Crude Oil Processed, 1976: 37.5% Kansas; 50.7% other states; 11.8% foreign

Data Sources: U. S. Bureau of Mines, Kansas Geological Survey, Kansas Corporation Commission, Oil and Gas Journal, Interstate Oil Compact Commission.



KANSAS CRUDE OIL PRODUCTION AND RESERVES

SOURCE: U.S. BUREAU OF MINES

COAL

YEAR	PRODUCTION (Short Tons)
1976	576,000
1975	479,000
1974	718,000
1973	1,086,000
1972	1,227,000
1971	1,151,000
1970	1,627,000
1965	884,690
1960	872,742

Reserves, January 1, 1977:	526 million tons
Average Value, FOB Mines, 1976:	$19.99/ton
Total Value of Production, 1976:	$11.5 million
Number of Mines Operating, January 1, 1977:	6

Data Sources: U. S. Bureau of Mines; Kansas Geological Survey.

ELECTRIC POWER

YEAR	INSTALLED GENERATING CAPACITY* (1,000 Kilowatts)	ENERGY PRODUCTION (Million Kilowatt Hours)
1976	6,054	19,294
1975	5,955	19,104
1974	5,798	18,200
1973	5,447	17,524
1972	4,114	16,957
1971	4,086	16,425
1970	3,657	15,929
1965	2,995	11,302
1960	2,036	8,222

* end of year

ELECTRIC ENERGY GENERATION BY TYPE OF FUEL USED
(excluding hydroelectric)

YEAR	NATURAL GAS	OIL	COAL	TOTAL
	(Million Kilowatt Hours)			
1975	10,980	2,970	5,115	19,064
1974	14,257	988	2,948	18,193
1973	15,191	538	1,792	17,520
1972	15,662	424	894	16,980
1971	15,257	257	748	16,262
1970	14,613	271	705	15,589

Investor-Owned Capacity as Percent of Total, Jan. 1, 1977:	73.3%
Investor-Owned Production as Percent of Total, 1976:	79.3%
Investor-Owned Sales as percent of Total, 1976:	73.9%
Number of Municipal Electric Utilities with Generating Systems:	63
Number of Rural Electric Cooperatives (not including Sunflower):	37

Total Electric Power Sales, 1976: 19,161 million kilowatt hours

Percent Sales, By Consuming Sector, 1976:

Residential	35.7%
Commercial	31.6%
Industrial	30.6%
Other	2.1%

Data Sources: Federal Power Commission;
Edison Electric Institute; Kansas Geological Survey

TOTAL KANSAS ENERGY CONSUMPTION
(in trillion Btu's)

	REFINED PRODUCTS	LPG's	NATURAL GAS	COAL	OTHER	TOTAL	ELECTRICITY SALES
1975	283.5	31.5	521.3	68.4	29.4	934.0	(62.3)
1974	255.8	29.2	609.2	38.5	29.0	961.8	(57.9)
1973	265.3	29.2	624.3	38.0	28.9	987.7	(57.1)
1972	255.8	28.8	653.6	28.3	25.7	992.1	(53.0)
1971	233.8	27.4	643.3	27.2	26.2	957.9	(50.1)
1970	234.7	28.5	604.9	21.3	24.1	913.6	(48.6)
1965	195.2	23.7	458.3	17.8	29.3	724.3	(34.7)
1960	186.2	20.8	329.8	14.7	15.6	567.1	(27.7)

1975 Energy Use, By Consuming Sector

Residential	15.7%
Commercial	10.8%
Electric Utilities*	18.1%
Transportation	29.0%
Industrial	26.4%

* This percentage does not reflect total fuel consumed by electric utilities, but rather the difference between total fuel use and electric power sales. If all of the fuel used by the electric utility sector were attributed here, the percentage would increase to approximately 25%. This, however, would tend to understate actual energy use by other sectors.

Data Source: Federal Energy Administration

MARKET DESTINATION OF KANSAS
NATURAL GAS PRODUCTION - 1975

STATE	QUANTITY (MMCF)	% OF TOTAL PRODUCTION
Kansas	293,743	37
Colorado	18,245	2
Illinois	53,160	7
Indiana	36,731	5
Iowa	56,196	7
Michigan	42,613	5
Minnesota	70,305	9
Missouri	86,194	11
Nebraska	61,258	8
Ohio	32,247	4
Oklahoma	4,694	1
South Dakota	5,372	1
Texas	13,854	2
Wisconsin	17,008	2
Canadian Exports	2,382	-
Net Storage	1,134	-
TOTAL	795,460	

Source: National Gas Flow Patterns 1975, Federal Power Commission

ORIGIN OF NATURAL GAS SUPPLIED
TO KANSAS MARKETS - 1975

FPC SUPPLY AREA	QUANTITY (MMCF)	% OF TOTAL
Kansas	293,743	52
New Mexico	13,304	2
Oklahoma - Anadarko	44,159	8
Oklahoma - Panhandle	64,569	11
Oklahoma - Other	11,415	2
Texas - RR. Dist. 7-C	4,396	1
Texas - RR. Dist. 8	25,399	4
Texas - RR. Dist. 9	886	-
Texas - RR. Dist. 10	107.754	19
TOTAL	566,616	

Source: National Gas Flow Patterns 1975, Federal Power Commission

FIRM DELIVERIES, CURTAILMENTS, & REQUIREMENTS OF NATURAL GAS IN KANSAS
SUMMARY OF FORM 16's FILED WITH THE FPC BY INTERSTATE PIPELINE COMPANIES*
HEATING SEASONS: 1975-76; 1976-77; 1977-78

		ALL VOLUMES IN MILLION CUBIC FEET			
		1975-76 (ACTUAL)	1976-77 (PROJECTED)	1976-77 (ACTUAL)	1977-78 (PROJECTED)
NOV.	DELIVERIES	29,328	27,378	27,708	27,807
	CURTAILMENTS	4,512	10,401	11,787	10,884
	REQUIREMENTS	33,840	37,779	39,495	38,691
DEC.	DELIVERIES	31,775	31,192	30,954	30,448
	CURTAILMENTS	11,148	12,478	14,127	14,009
	REQUIREMENTS	42,923	43,670	45,081	44,457
JAN.	DELIVERIES	32,894	33,089	32,823	33,511
	CURTAILMENTS	14,344	14,679	18,526	15,432
	REQUIREMENTS	47,238	47,768	51,349	48,943
FEB.	DELIVERIES	26,978	29,225	24,805	28,851
	CURTAILMENTS	11,155	13,952	15,371	13,994
	REQUIREMENTS	38,133	43,177	40,176	42,845
MAR.	DELIVERIES	28,070	29,475	25,935	29,639
	CURTAILMENTS	9,753	12,192	11,362	13,315
	REQUIREMENTS	37,823	41,667	37,297	42,954
5-MO. TOTAL	DELIVERIES	149,046	150,359	142,225	150,256
	CURTAILMENTS	50,911 (25.5%)	63,701	71,173 (33.3%)	67,634 (31.0%)
	REQUIREMENTS	199,957	214,060	213,398	217,890

* Companies include: Arkansas-Louisiana, Cities Service, Colorado Interstate, Kansas-Nebraska, Michigan-Wisconsin, Natural Gas Pipeline Company of America, Northern Natural Gas, Panhandle Eastern

KANSAS COAL RESOURCES AND PRODUCTION

by

Lawrence L. Brady
Kansas Geological Survey

Introduction

Coal Deposits in Kansas have been exploited for over one hundred years with a total production of nearly 300 million tons. There have been two major rises and falls in production during this period of time with both peaks corresponding to World War I and World War II (Fig. 1). The availability and use of natural gas and petroleum in Kansas was the primary factor in the decline of Kansas coal. However, the decline in the availability of natural gas, and the greatly increased cost of petroleum for power generation and industrial use is resulting in a resurgence in the use of coal. In the United States the 665 million tons produced in 1976 was the largest amount produced in one year. Although the Kansas 1976 coal production was only 576 thousand tons and the second lowest production year during the twentieth century, the outlook is for increased coal production over the next twenty years.

In order to understand the place of Kansas in the future, it is necessary to look at the coal resources and general character of Kansas coal. Deposits of coal in Kansas are located in the eastern portion of the state, except for minor deposits of lignite located in north-central Kansas. The large coal bearing area in the central United

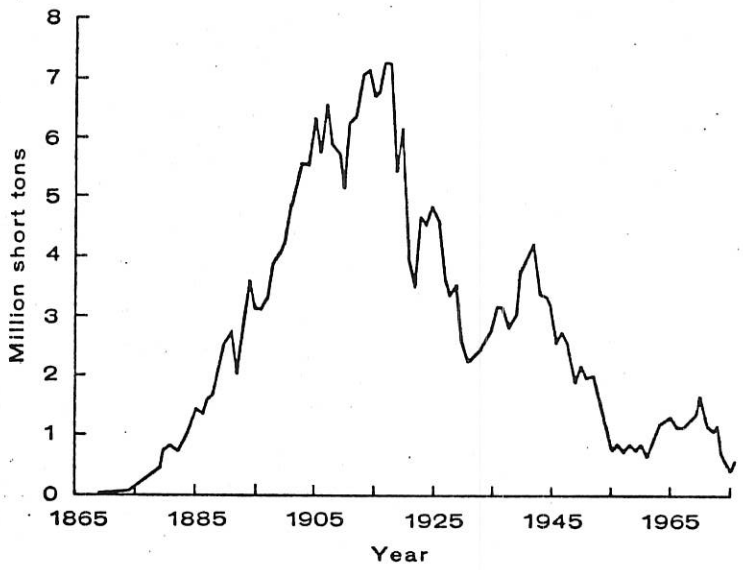


Figure 1. Kansas coal production 1869-1976.

States that includes the Kansas coal is the Western Interior Basin (Fig. 2). All of the coal in this major coal basin is of bituminous rank except for a very small area in Arkansas.

In most of the coal basin area, more than one coal bed is present, and in Kansas, 53 different bituminous coal beds have been identified, 17 of which have potential for commercial production. Many of the coals have widespread distribution in Kansas and represent deposits of plant remains that were present in large swamp areas located close to inland seas that existed at that time. Subsequent burial of the organic material along with the other sediments and the resultant increase in heat, pressure, and over a time period of nearly 300 million years resulted in the bituminous coal beds that are present today.

Within this larger coal bearing area are located the coal reserves and resources of the state. Coal resources can be defined as those coal deposits that are economically feasible to mine at the present time or have the potential to be mined in the future. Resources of coal must be determined from coal thickness measurements and these data are then extrapolated over a given area taking into consideration potential changes in the coal thickness and the geology of the area. In the eastern one-fourth of the state, all the counties except Allen, Johnson and Wyandotte have some coal resources present. Coal reserve figures, in contrast to resources, represent the coal that has the potential to be economically mined at the time of determination and commonly with a coal recovery factor considered.

A new term that is now widely used in government evaluations is coal reserve base. This term implies the amount of coal in the ground

Figure 2. Distribution of major coal areas in the United States (from Averitt, 1975, p. 5).

that is considered economically and legally available for mining at the time of determination. This term also carries constraints of coal thickness and distance away from a coal data point.

Kansas Coal Resources

The best estimate of the coal resources in Kansas is nearly 22.7 billion tons by Averitt (1975) and this figure represents less than one percent of the total U. S. coal resources totalling slightly under four trillion tons. This estimate is based primarily on earlier Kansas Geological Survey studies by Abernathy, Jewett, and Schoewe (1947) and Schoewe (1958).

Kansas coal has two general characteristics limiting its development and use.

(1) All the coal resources are believed to be medium- to high-sulfur coal (coal containing more than one percent sulfur). Commonly, there is three to five percent sulfur in most commercial Kansas coals.

(2) Most of the coal resources in Kansas are thin-bedded coals (less than 28 inches). A few areas have coal that exceed this thickness, especially where the Weir-Pittsburg coal bed is present and in a few areas where the Mulberry coal is present.

The thin nature of Kansas coal is also a major factor in development of the coal resources because of the mining costs of working a larger area than would be required for a thicker coal bed. Of the Kansas coal resource, less than 3 billion tons is close enough to the surface to be surface mined regardless of its thickness. Therefore,

future development of at least 85 percent of the resources would have to be by some underground mining method. At the present time, a minimum thickness of coal considered feasible to mine by underground methods is 28 inches. Probably less than ten percent of the Kansas coal resources are greater than 28 inches in thickness.

In the past, most of the Kansas coal production was from underground mines. Nearly 200 million tons of the state total of 300 million tons was mined by underground methods. Over 28 million tons of the coal mined was won by underground methods from coal beds less than 28 inches in thickness, mainly in Leavenworth, Osage, and Linn counties. Most of the deep production, however, was from the Weir-Pittsburg coal bed in Crawford and Cherokee counties were the coal bed averaged 36 inches in thickness.

As the tonnage of coal obtained by deep mining decreased, the percentage of coal produced by strip mining increased until 1964 when all of the Kansas coal was mined by surface-mining methods. With the lower costs and increased safety of surface mining and the presence of mainly thin coal beds in Kansas, it is anticipated that future mining will continue to be primarily by surface-mining methods. Therefore, because of the thin nature of Kansas coal beds and the increased emphasis of strip mining, most of Kansas coal resource tonnage will never be mined unless there are significant future developments in mining technology or perhaps underground gasification techniques that can utilize the Kansas coal.

Strippable Coal Reserve Base

The strippable coal reserve base in Kansas is estimated by Brady,

Adams, and Livingston (1976) to be 526 million tons for coals under a soil and rock cover equal to or less than 30 times the thickness of the coal. An areal limitation of three-fourths of a mile from a known coal thickness was used for the estimate. Besides the 526 million tons, there is an additional coal amount of nearly 800 million tons located within a three mile radius from a known data point and still having a 30:1 overburden/coal ratio.

Seventeen different coal beds occurring in five different rock groups are present in Kansas that have the potential for economical development by strip mining. These coals were formed from organic debris deposited in a geologic period of time referred to as the Pennsylvanian Period.

Among the coal beds in Kansas having the largest strippable coal reserves are the Mineral, Bevier, Mulberry, and Nodaway coal beds. These four coals make up 64 percent of the strippable coal reserve base. Of these four coals, only the Mineral and Bevier are presently being mined in Kansas. Extensive mining of the Mulberry coal is expected in the near future, and development of the Nodaway coal is presently limited because of its sulfur content and chemical characteristics. A generalized distribution of the various strippable coals is shown in Figure 3.

There are 23 counties in eastern Kansas that contain strippable coal and three of the counties - Cherokee, Crawford, and Linn - contain 66 percent of the strippable reserve base. Future coal mining in Kansas will probably be concentrated in these three counties with additional mining in Bourbon and Osage counties. Distribution of the strippable coal reserves by counties is listed in Table 1.

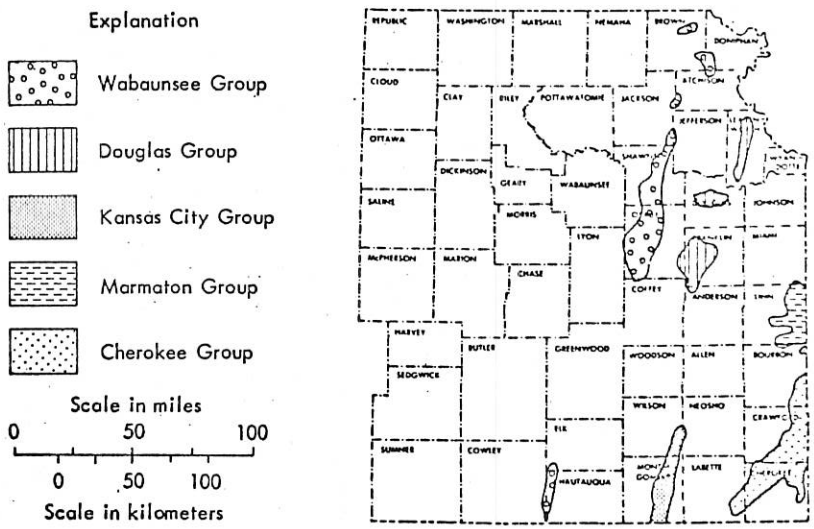


Figure 3. General distribution of strippable coal reserves by geologic group for coals under 100 feet of overburden or less.

Table 1. -- Distribution by County of the Strippable Coal Reserve Base in Kansas Having a 30:1 Overburden/Coal Ratio (in millions of tons).

County	Demonstrated	Inferred
Anderson	3.3	0.7
Atchinson	6.2	3.6
Bourbon	27.5	59.4
Brown	7.8	22.6
Chautauqua	3.2	4.1
Cherokee	150.6	263.8
Coffey	4.1	7.4
Cowley	2.7	10.8
Crawford	98.1	126.3
Doniphan	0.8	5.8
Douglas	3.5	16.6
Elk	--	0.2
Franklin	20.5	17.3
Jackson	0.7	2.6
Jefferson	3.5	6.3
Labette	8.9	--
Leavenworth	12.2	20.6
Linn	97.6	141.0
Lyon	0.6	0.3
Miami	--	4.6
Montgomery	4.8	9.1
Neosho	1.1	2.9
Osage	49.3	35.8
Shawnee	17.2	29.3
Wilson	1.7	4.0
Total	525.9	795.1

Kansas Coal Production

After having reached the low point in coal production of 517 thousand tons, in 1975, Kansas coal is starting a slow recovery that should result in a continued increase in coal production for a number of years. Kansas coal production consistantly was over a million tons through the 1960's and 70's to 1974. This decline in coal production in 1974 is due primarily to the closing of Mine #19 of the Pittsburg and Midway Coal Mining Company in Cherokee County. This mine at the time of closing accounted for about two-thirds of the annual coal production in Kansas. Since the Mine #19 closing, there have been seven coal mines open in Kansas. In 1976, coal production recovered to 576 thousand tons.

With continued interest, 1977 coal production could approach 750 to 800 thousand tons with close to one million tons coming in 1978 or 1979. This anticipated increase in production is due to an increased demand by power utilities, especially the LaCygne Power Station in Linn County. Pollution abatement equipment at the LaCygne Power Station allows high sulfur Kansas coal to be burned. At the present time, the principal coal supplier to the plant, the Pittsburg and Midway Coal Mining Company, cannot supply the total coal tonnage needed at the plant, thus developing a new local coal market. Increase interest in coal reserves in 1976 and early 1977 was mainly in the area south of the La Cygne plant, especially in Bourbon County. Although extensive reserves of coal exist in eastern Linn County, most of these are under control by the Pittsburg and Midway Coal Mining Company which supplies most of the coal to the La Cygne plant. Increased demand by the industrial market should also help the Kansas coal market,

especially the increased usage of coal in the manufacture of cement by four of the five cement plants in Kansas.

When the Pittsburg and Midway Coal Mining Company start mining its coal properties in Linn County at some period anticipated to be 5 to 10 years from now, Kansas coal production should show a marked jump in production of 1 to 1.5 million tons. By 1985 Kansas coal production could be near 2 to 3 million tons of annual production.

At the present time, there are ten coal mines in operation or operating periodically in Kansas (Fig. 4). The larger of these ten mines are Clemens Coal Company's Mine #22 and Mine #25 in Crawford County, and Bill's Coal Company's Ft. Scott Mine in Bourbon County. Fuel Dynamic's Golden Eagle Mine (Crawford Co.) and Bills' Coal Company's Fulton Mine (Bourbon Co.) are two new mines that have the potential to produce several hundred thousand tons of coal a year. In addition to these ten mines in Kansas, several additional small mines could open within a year in Bourbon and southern Linn County.

Summary

Kansas has a large area underlain by coal deposits and a large resource of coal totaling about 0.5 percent of the coal resources of the United States. However, only a small portion of this total resource will be worked in the future unless significant changes occur in the present methods of coal extraction or utilization. This limitation on the use of the resources is due to the occurrence of the coal primarily as thin beds thus limiting its development by present underground mining methods. However, there is a large tonnage of coal in Kansas that can still be mined by strip mining methods. This total

MINE NAMES

1. Fulton Mine (Bill's Coal Co.)
2. Ft. Scott Mine (Bill's Coal Co.)
3. Bradbury Bros. Mine #1
4. Bradbury Bros. Mine #2 *
5. Mine #22 (Clemens Coal Co.)
6. Mine #25 (Clemens Coal Co.)
7. Croweburg Mine (Alternate Fuels, Inc.) *
8. Golden Eagle Mine (Fuel Dynamics, Inc.)
9. Wilkinson's Inc. Mine
10. Thayer Mine (Beachner Const. Co.) *

* Not presently mining coal (Aug 1977) but have operating permits.

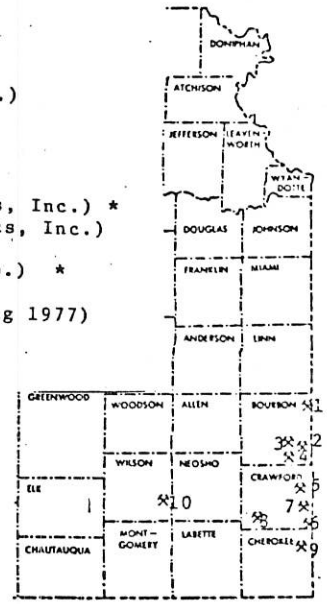


Figure 4. Location of coal mines operating in Kansas in 1977.

amount of coal in place amounts to over 500 million tons of coal demonstrated and an additional 800 million tons that can be potentially mined. Most of the surface mining will continue to be in the southeast part of Kansas, primarily in Cherokee, Crawford, Bourbon, and Linn counties.

Kansas should continue to have increased growth in coal production in the latter part of this century due to increased demand by power companies and industry. This production will be restrained, however, by the much larger influx of western coals to meet the larger demands for coal in the state. This is already indicated by the announced planned use of Wyoming coal at the La Cygne Power Station #2, the Jeffrey Energy Center near St. Marys, and the gasification plant near Wichita that is presently under study.

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Attachment 3.

Testimony on Kansas Mined Land
Reclamation presented to the Special Interim
Kansas Legislative Energy
Committee

by R. G. Hardy

Kansas Geological Survey
W.W. Hambleton, Director
University of Kansas
Lawrence, Kansas 66044
August 22, 1977

Kansas Mined-Land Conservation and Reclamation Act; Key Provisions and Comments--

After January 1, 1969, it became unlawful in Kansas to engage in surface types of mining where surface mining "relates to the mining of coal by removing overburden lying above the natural deposit thereof, and mining directly from the natural deposit thereby exposed" unless a valid permit issued by the board (Mined Land Conservation and Reclamation Board) designating the area of land affected by the operation is obtained.

It is declared policy of this state "to provide for the reclamation of affected lands to encourage productive use, including but not limited to: The planting of forests, the seeding of grasses, and legumes for grazing purposes; the planting of crops for harvest, the enhancement of wildlife and aquatic resources; the establishment of recreational, home, and industrial sites; and for the conservation development, management, and appropriate use of all the natural resources of such areas for compatible multiple purposes, and protecting the health, safety and general welfare of the people as well as the natural beauty and aesthetic values in the affected areas of this state."

It might be well to briefly describe what happens at a specific site when surface mining for coal is performed. The primary impacted environmental factors include topography, soils, hydrologic characteristics, vegetation, wildlife, air quality, land use, and mineral resources.

There will be a marked change in the topography, which in some cases will have a major impact on the remaining factors of environment. Vegetation and wildlife will be destroyed or displaced.

Soil is a basic resource for vegetation and of primary concern in evaluation of reclamation methods. The physical, chemical, and biological systems associated with natural oil sequences will be completely disrupted and changed to a varying and unknown degree.

During the mining operation the existing drainage pattern will be disrupted.

For most of the disturbed area the physical destruction of habitat and the smaller fauna in it would be complete--in essence, removing the lower levels of the ecological food chain.

The removal of vegetation and disturbance of topsoil and overburden will expose soil and present material to wind action.

In Kansas, areas devoted to grazing and cropping will be disturbed annually by removing them from agriculture production.

And finally, the mining operation will remove the shallow cover coals; other mineral resources consist mainly of shales of little economic value and low grade fireclays which do have a small market.

Pursuant to the state philosophy, key provisions of the Kansas Mined Land and Conservation Act include--

1. requiring all operators to obtain an annual permit to engage in surface mining,
2. bonding of up to $1,000 per acre for land to be affected by strip mining,
3. obtaining and submitting of permits from other regulatory agencies where changes in water courses, highways, roads, and utility lines are expected,
4. preplanning requirements for mining and reclamation,
5. restoring the land to a rolling terrain,
6. penalty for non-compliance (forfeiture of bond),
7. denial of permits where such mining would constitute a hazard to other property,
8. reclamation must be kept current with mining, and
9. restored land must meet board approval before bond is released, which in general means that after a strip mining operation has been backfilled, graded, and approved, the operator shall prepare the soil and plant such legumes, grasses, shrubs, and trees on the affected land as are necessary to provide a suitable, permanent, diverse vegetative cover capable of regenerating under the natural conditions prevailing at the site and preventing soil erosion to the extent achieved prior to the operation.

It is my personal feeling that this act is fulfilling its intent for the Kansas coal mining region. It is not without its weaknesses; again, a personal opinion. From my viewpoint the act needs strengthening on two points, (1) more precise, definitive standards should be used to evaluate the quality of restored land and (2) extend the liability time of an operator's responsibility to achieve satisfactory vegetation. Also in my opinion, a system of aerial photography would be most useful and helpful to observe the entire mining sequence from premining conditions to restoration.

In the present Kansas coal field, coal extracted is calculated at 1500 tons per acre of coal one foot thick. Currently the average coal thickness is 1-1/2 feet or 2250 tons of coal per acre. In 1976 coal produced in Kansas is reported at 576,000 tons, requiring slightly over 200 acres of land which, in turn, required reclamation.

Since the enactment of the Kansas Mined Land Reclamation law there

have been 12 permitted parcels of land for coal extraction as shown on the accompanying maps. Currently, there are 7 coal companies active in coal mining in Kansas. These include the following:

The Clemens Coal Co.

Bradbury Bros. Co. Co.

Beachner Construction Co.

Fuel Dynamics Co.

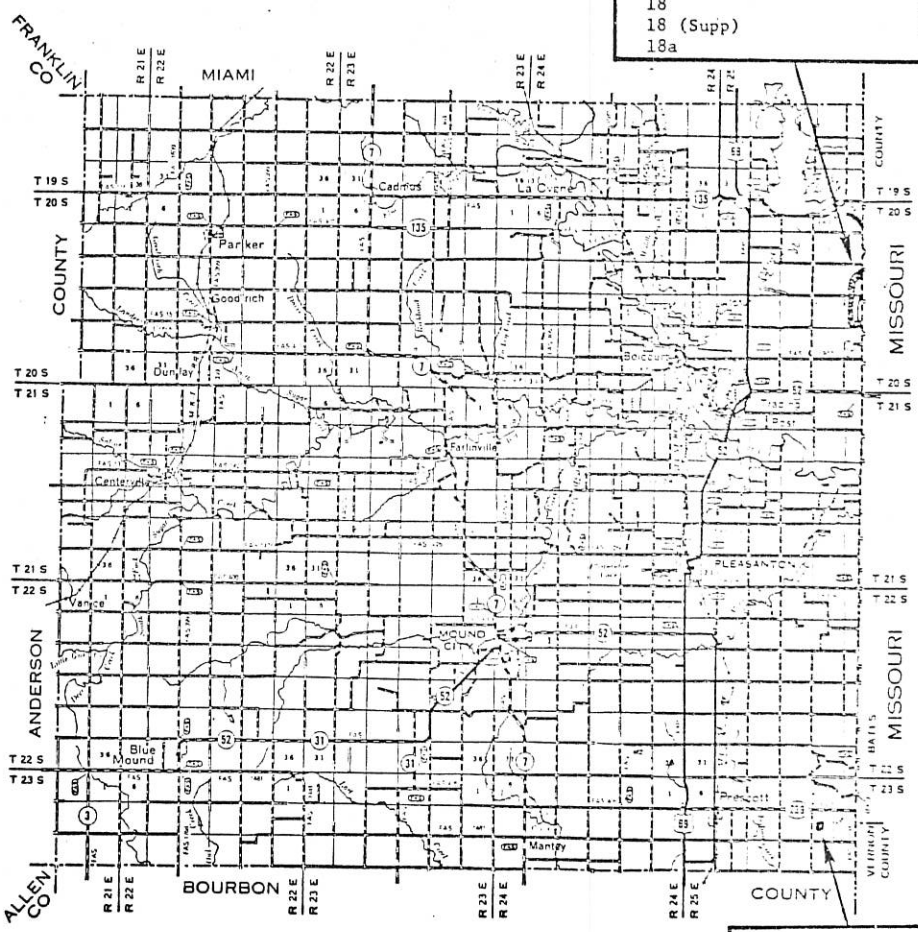
Alternate Fuels, Inc.

Bills Coal Co.

Wilkinson, Inc.

The accompanying maps also indicate the scale of operation of these companies.

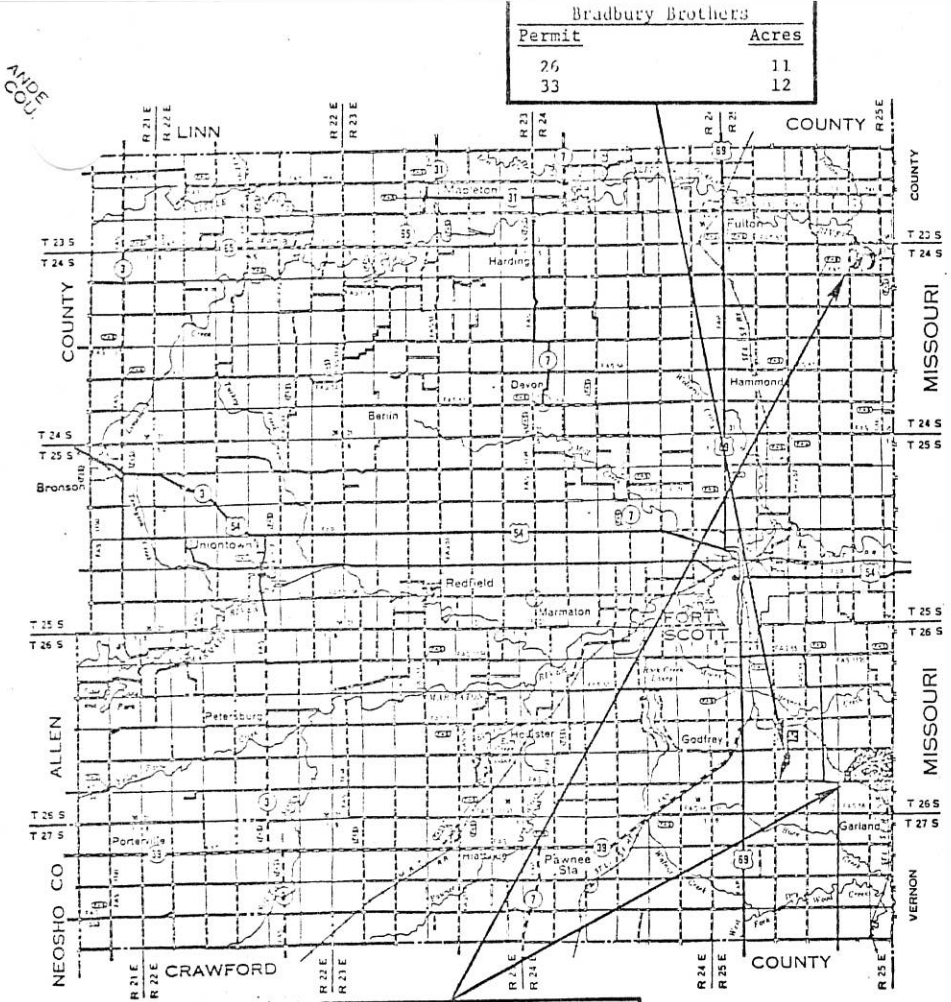
Pittsburg & Midway - Midway Mine	
Permit	Acres
12	210
18	140
18 (Supp)	105
18a	12



Fyock Coal Co.	
Permit	Acres
5	2

GENERAL HIGHWAY MAP
LINN COUNTY
KANSAS
STATE HIGHWAY COMMISSION OF KANSAS
DEPARTMENT OF PLANNING AND DEVELOPMENT
U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
1969

54



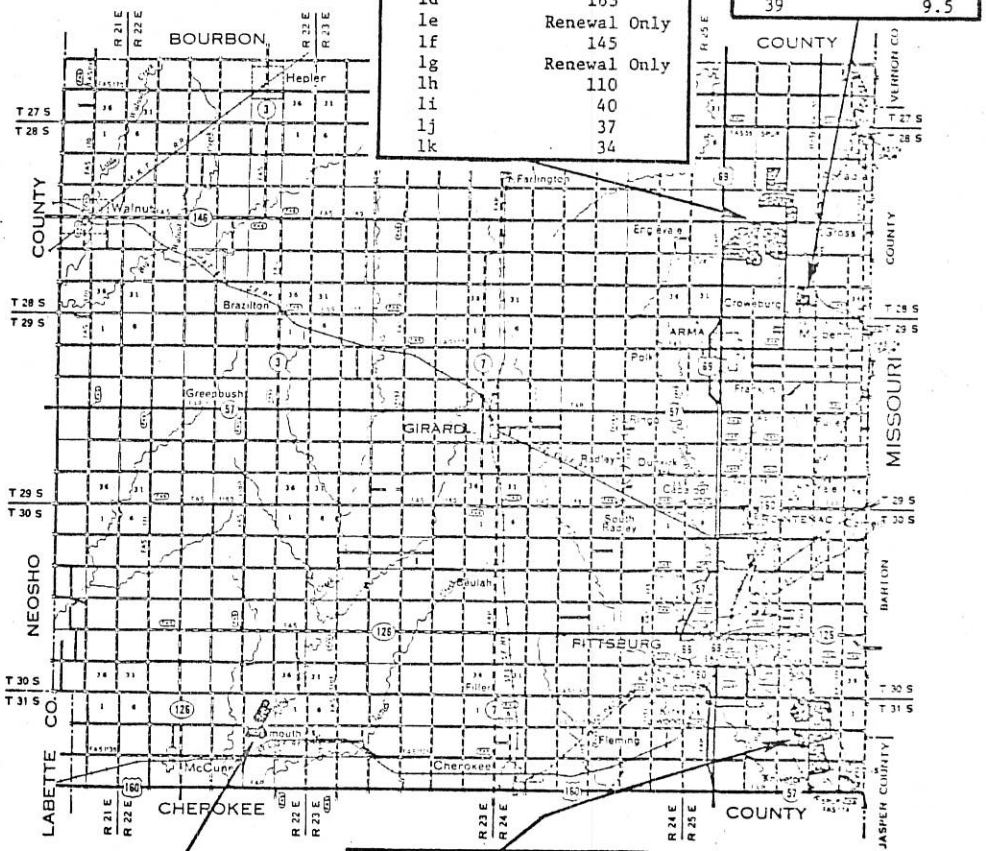
Bradbury Brothers	
Permit	Acres
26	11
33	12

Bill's Coal Co.	
Permit	Acres
23	90
23a	Renewal Only
27	30
28	61
T-31	55
32 (From T-31)	46
34	93
38	80

GENERAL HIGHWAY MAP
BOURBON COUNTY
KANSAS
PREPARED BY THE
STATE HIGHWAY COMMISSION OF KANSAS
DEPARTMENT OF PLANNING AND DEVELOPMENT
IN COOPERATION WITH THE
U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
SCALE
1971

Clemens Coal Co.	
Permit	Acres
1	116
1a	1
1b	1
1c	168
1d	163
1e	Renewal Only
1f	145
1g	Renewal Only
1h	110
1i	40
1j	37
1k	34

Alternate Fuels	
Permit	Acres
36	9.5
39	9.5

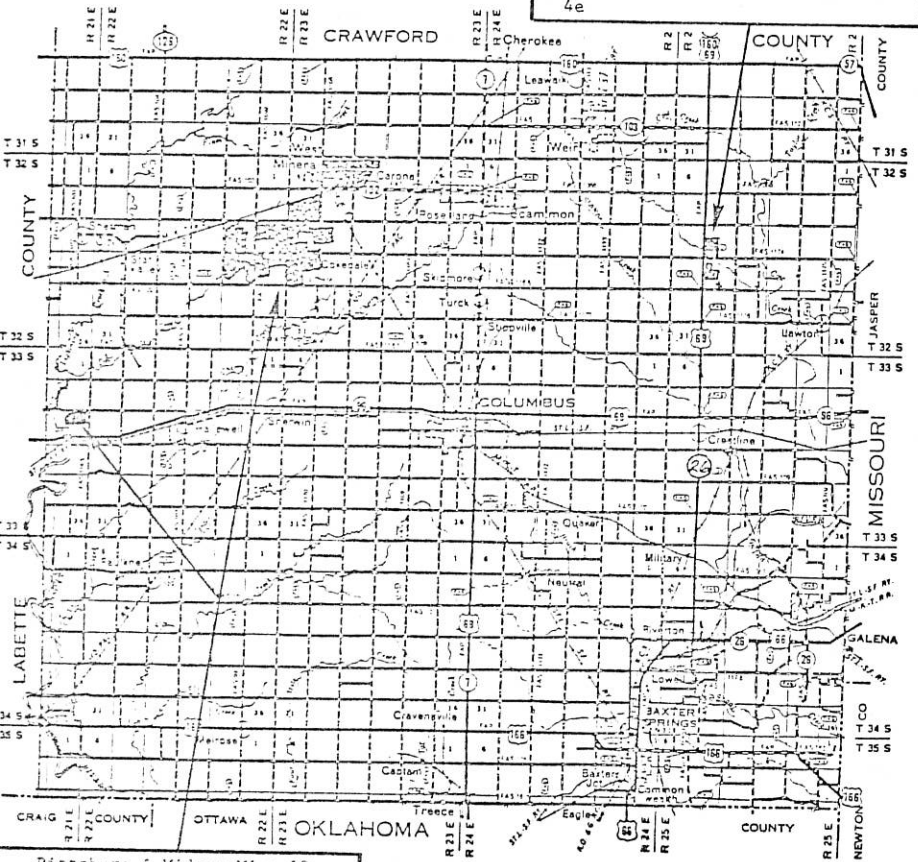


Fuel Dynamics, Inc.	
Permit	Acres
35	20
37	27

Clemens Coal Co.	
Permit	Acres
8	101
8a	126
8b	113
8c	60
8d	74
8e	117
8f	Renewal Only
8g	144
8h	70

GENERAL HIGHWAY MAP
CRAWFORD COUNTY
KANSAS
PREPARED BY THE
STATE HIGHWAY COMMISSION OF KANSAS
DEPARTMENT OF PLANNING AND DEVELOPMENT
IN COOPERATION WITH THE
U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
SCALE
1969

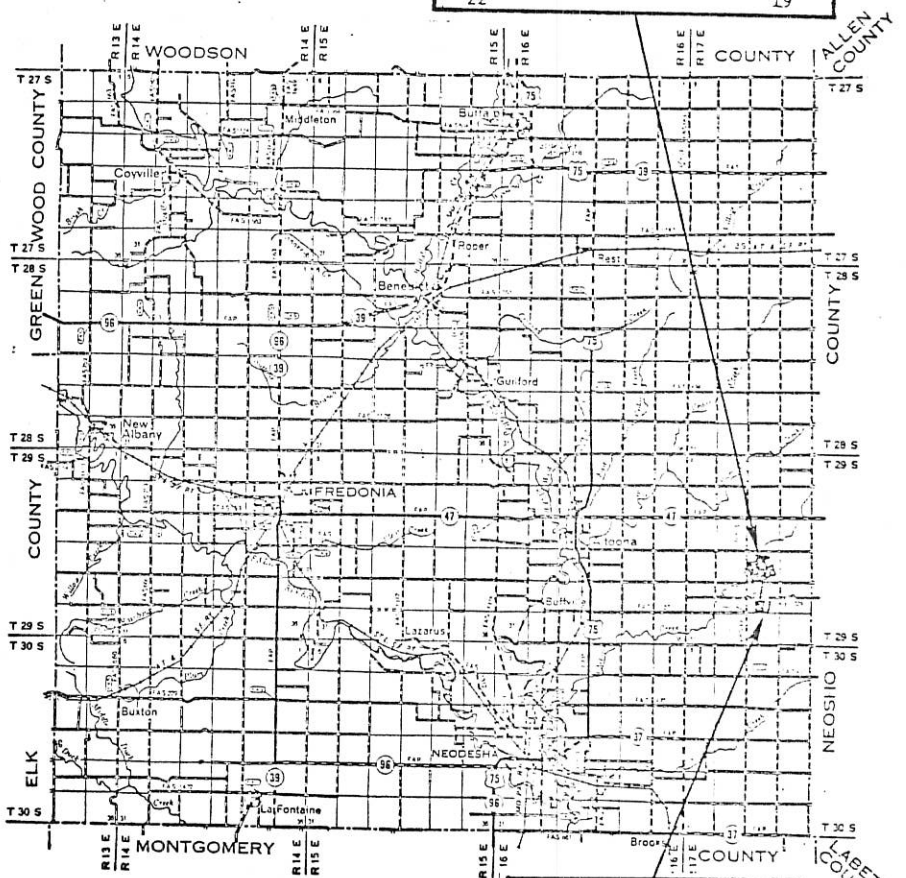
Wilkinsons	
Permit	Acres
4 (Amend)	6
4a (Amend)	4
4b	11
4c (8 Acres From Prev. Permit)	15
4d	3
4e	3



Pittsburg & Midway-Mine 19	
Permit	Acres
2	545
7	429
7 (2nd Amend)	11
10	545
10 (Amend)	70
11	277
13	99
14	297
16	371
17	135
19 (Acres from Permit 16)	160

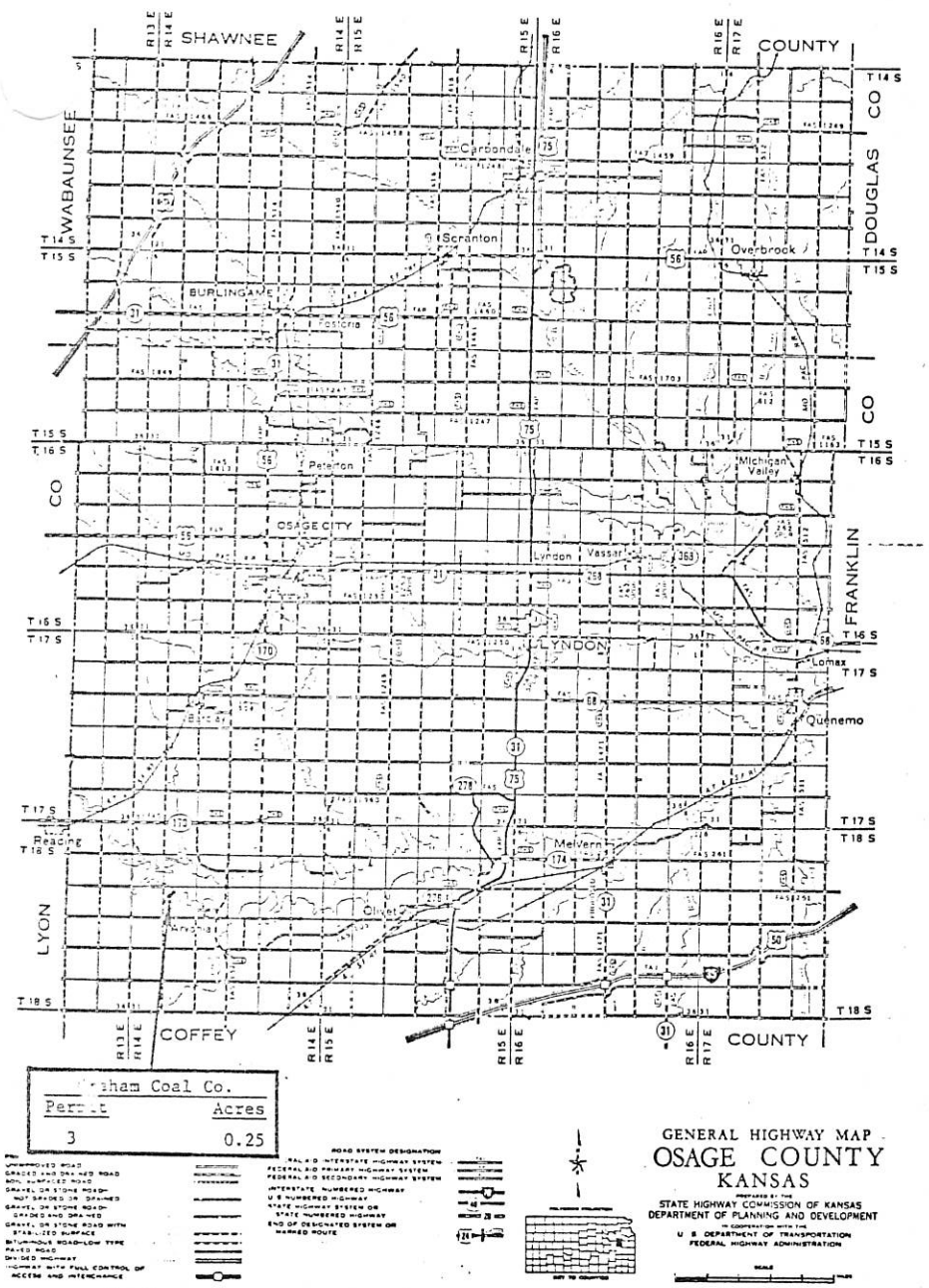
GENERAL HIGHWAY MAP
CHEROKEE COUNTY
KANSAS
STATE HIGHWAY COMMISSION OF KANSAS
DEPARTMENT OF PLANNING AND DEVELOPMENT
U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
1969

Lamb Coal Co.	
(Area abandoned. Under reclamation by Beachner Construction Co.)	
Permit	Acres
21	42
22	19



Beachner Construction Co.	
Permit	Acres
24	49
25	3

GENERAL HIGHWAY MAP
WILSON COUNTY
KANSAS
STATE HIGHWAY COMMISSION OF KANSAS
DEPARTMENT OF PLANNING AND DEVELOPMENT
U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
BUREAU OF PUBLIC ROADS
1970



Permit	Acres
3	0.25

GENERAL HIGHWAY MAP
OSAGE COUNTY
KANSAS

STATE HIGHWAY COMMISSION OF KANSAS
DEPARTMENT OF PLANNING AND DEVELOPMENT
IN COOPERATION WITH THE
U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

1974

Important differences between Kansas Regulations and the New Federal Law--

Differences in Kansas and Federal regulations of particular importance to Kansas operations are:

1. Kansas law does not require removal of final highwall; Federal regulations specify restoring the original contour of the land,
2. removal and stockpiling of topsoil for eventual placement on graded spoil banks,
3. increased restrictions relative to water impoundments,
4. replacing the water supply on an owner of interest in real property--where such supply has been affected....,
5. provide adequate advance written notice by publication and for posting of the planned blasting schedule to local governments and residents....,
6. extend responsibility for successful vegetation to five years,
7. provides for release of bonds in 3 stages,
8. requires public notice of hearings for permit applications, persons with objections may participate in an informal conference,
9. permits to be issued for 5 years normally,
10. State laws to be no less stringent than Federal,
11. State must designate those areas unsuitable for surface coal mining,
12. provide for disposal of surplus spoil materials,
13. provides for reclamation of abandoned mined land with a fund generated by a tax of 35 cents per ton on current surface mining production.

STATE PROCEDURE TIMETABLE

D. Procedure and timetable for obtaining an approved state regulatory program

1. Basic timetable of bill

90 days -- Secretary must issue regulations for interim environmental performance standards.

6 months -- All new mines must comply with interim standards. (Interim standards address postmining land use, regrading requirements, topsoil separation, hydrologic requirements, waste disposal, waste piles, blasting, revegetation, steep slope mining, and mountaintop removal.)

9 months -- All existing mines must comply with interim standards.

1 year -- DOI must issue regulations for full regulatory programs.

18 months -- State must submit application to assume exclusive state jurisdiction. This deadline and those following can be extended to 24 months by the Secretary if an act of the state legislature is necessary to formulate a state program.

24 months -- Secretary of Interior must approve or disapprove state program.

26 months -- State must submit revised program if originally disapproved.

28 months -- Secretary of Interior must act on revised state application.

2. If a state fails to submit a program or is finally disapproved, or fails to enforce an approved program, the Secretary of the Interior must implement a federal program for that State. A state can resubmit a state program for approval at any time after a federal program has been implemented.

3. To be approved, a state program must include the following:

--state law consistent with the Act and accompanying regulations

--sanctions for violations of permits including civil and criminal penalties, bond forfeiture, suspensions, revocations and cease-and-desist orders

--sufficient administrative and technical personnel and sufficient funding

--a permit system

--a process for the designation of lands unsuitable for surface coal mining

--a process for coordinating surface mining permits with other state and federal permits to avoid duplication

4. State laws may be more stringent than the requirements of this Act.

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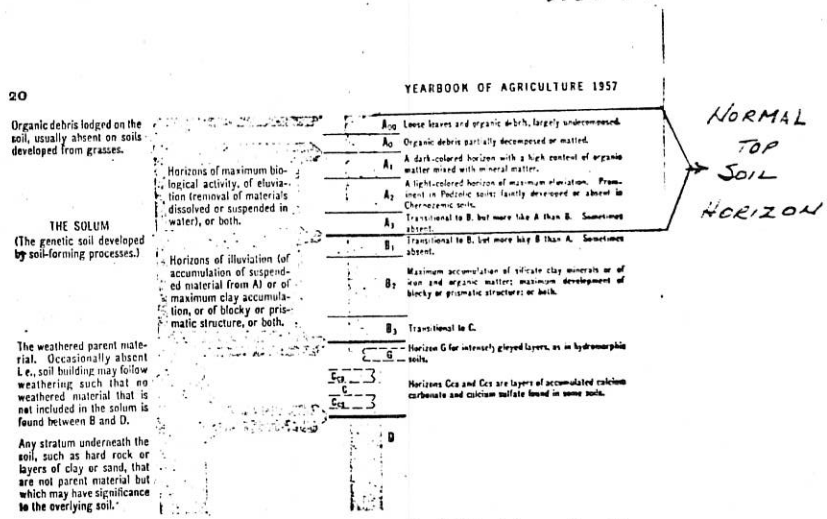
Soil Profile



2. A hypothetical soil profile that has all the principal horizons. Not all of these horizons are present in any profile, but every profile has some of them.

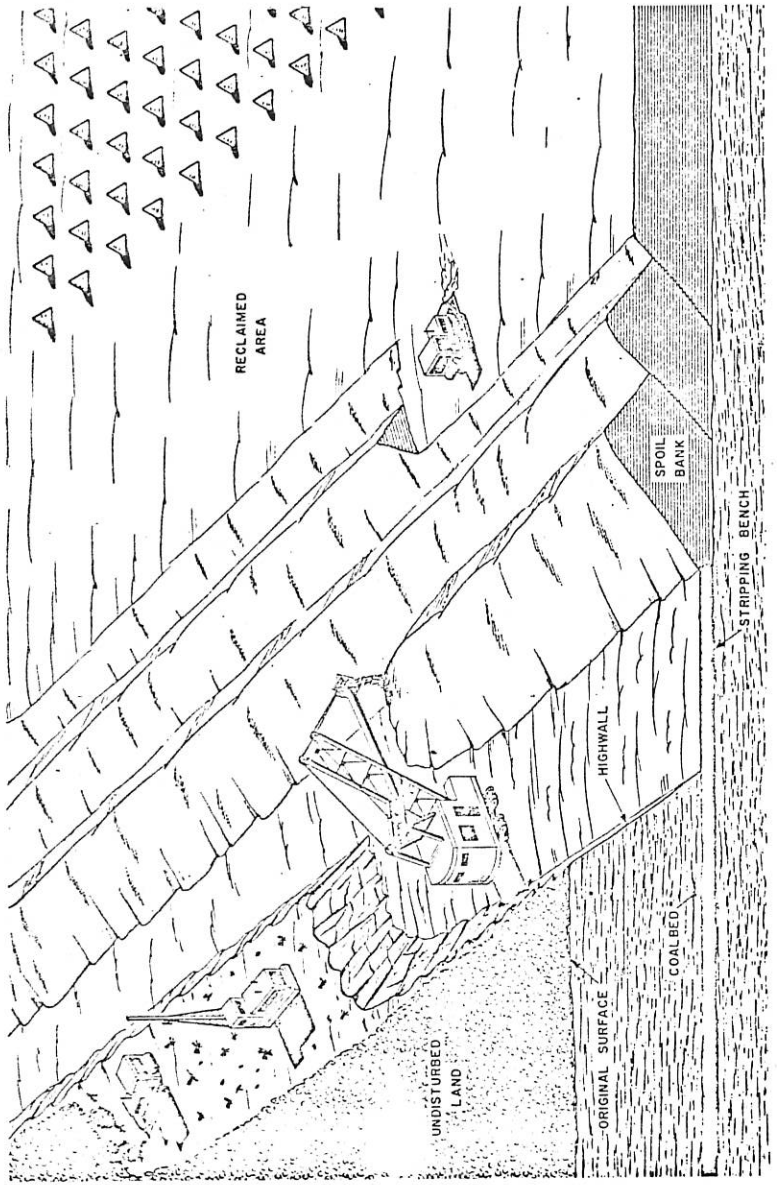


FIGURE 26. Area Strip Mining With Concurrent Reclamation.

Focus on Coal:

Congress Clears Strip Mining Control Bill

Congress July 21 cleared for President Carter's signature the Surface Mining Control and Reclamation Act of 1977 (HR 2). The action meant that an end was near for a five-year effort to impose federal regulation on the strip mining of coal in all parts of the country. HR 2 was among the relatively few bills that genuinely deserved to be called "landmark legislation."

The House approved the conference report of the bill July 21 by a 325-68 vote. The Senate adopted the report July 20 by a vote of 85-8 after rejecting 43-53 a motion to recommit. *(House vote 420, p. 1554; Senate votes 308, 309, p. 1552)*

For once, supporters of strip mining control did not have to worry about a veto. Jimmy Carter supported such legislation during the 1976 presidential campaign, and he urged the 95th Congress to pass the bill quickly as a cornerstone of his national energy policy.

Until 1977, environmentalists and others who supported the legislation had been thwarted. The House approved a bill in 1972 but the Senate did not act. President Ford pocket-vetoed a bill in 1974 after the 93rd Congress had adjourned. In May 1975 Ford vetoed another bill, and the House failed to override by only three votes. Twice in 1976, with a veto still certain, the House Rules Committee prevented strip mining bills from reaching the floor.

As finally approved in 1977, HR 2 pleased environmental lobbyists for the most part. Coal mining representatives who had opposed all such legislation were unhappy with the bill, but relieved that certain exemptions and variances had been allowed. Senate and House conferees generally felt they had reached a good compromise. Rep. Morris K. Udall (D Ariz.), a principal advocate of strip mining control, said through a spokesman that he felt "personal satisfaction" that the long struggle had been won.

Focus on Coal

The legislation was directed primarily at strip mining for coal. Other types of strip mining were largely untouched by the bill.

Environmentalists acknowledged that this was a substantial omission and noted that early versions of the legislation drafted several years earlier covered all strip mining. This universal coverage was dropped when it became clear that opposition from copper and other mining interests plus coal companies probably would have permanently doomed any legislation.

But even as it eventually was written, the strip mining bill dealt with an enormous problem and became all the more crucial as President Carter made increased use of coal a key element in his energy program.

Earlier in 1977, the Senate Energy and Natural Resources Committee reported that coal strip mining disturbs 1,000 acres of land each week. Of four million acres already disturbed by surface mining of all sorts, 43 per cent were damaged by coal extraction.

Moreover, the coal strip mining problem—unlike that of other mining efforts—was nationwide. The legislation recognized that.

In the East, much of the damage to land had already been done. Only half of the 1.3 million acres of strip-mined land in eastern coalfields have been reclaimed. HR 2 established a special fund to help pay for reclamation.

In the West, vast deposits of coal exist to be claimed, principally by strip mining. The recent record of strip mining suggested that extraction of that coal would increase dramatically: In 1970, almost 44 per cent of U.S. coal production came from surface mines; for 1976 it was estimated this figure would jump to 56 per cent. Carter's emphasis on coal made this increase likely, coal experts agreed. In recognition of this, much of HR 2 was directed at controlling the conditions under which strip mining would occur.

The Congressional Budget Office (CBO) estimated that the federal government's five-year net cost of HR 2 would be $360-million for fiscal 1978-1982. Larger amounts were expected to be collected and spent through the Abandoned Mine Reclamation Fund, supported through fees on mined coal.

Final Action

The House approved its original version of HR 2 on April 29; the Senate approved a companion bill (S 7) May 20. The conference report on HR 2 was filed July 12. *(House passage, Weekly Report p. 780; Senate passage, p. 1041)*

Before the conference report could be adopted, HR 2 had to clear one last hurdle in the Senate July 20. Dale Bumpers (D Ark.), a member of the conference committee, moved to recommit the report. He wanted to instruct the Senate conferees to reconsider the issue of surface owner protection.

Essentially, Bumpers wanted to restore language approved by the Senate when it considered S 7. An amendment offered by Bumpers May 20, and agreed to by voice vote, provided that the Secretary of Interior could in some cases overrule a surface owner's objection to mining federal coal beneath his land and could pay the surface owner generously. The original House bill required written consent of the surface owner before federal coal could be mined, and that position won in conference.

Highlights of Bill

As cleared by Congress, HR 2 contained the following major provisions:

- Set performance standards for environmental protection to be met at all major surface mining operations for coal.
- Provided for joint responsibility and enforcement by the states and the federal government.
- Established a self-supporting Abandoned Mine Reclamation Fund to restore lands ravaged by uncontrolled mining operations in the past.
- Protected certain lands regarded as unsuitable for surface mining.
- Established mining and mineral resource institutes, and provided funds for coal research laboratories and energy graduate fellowships.

Bumpers said the provision in HR 2 meant: "If anybody owns the surface over the coal the United States owns, we just cannot mine it, no matter how badly we may want it." He argued that the federal government had retained mineral rights many years ago in order to have the reserves when they were needed. Bumpers said the provision in HR 2 applied almost entirely to four states—Montana, Wyoming, South Dakota and North Dakota—where about half the federal coal is under privately owned land.

Lee Metcalf (D Mont.) said it was unrealistic to think the conference would consider only that provision if it had to meet again.

Although many senators appeared to share Bumpers' distaste for the surface owner consent requirement, the majority voted against going back to conference. Bumpers' motion to recommit was rejected, 43-53. The conference report was promptly adopted, 85-8.

Conference Action. A coal lobbyist who sat through the conference, Carter Manasco of the National Coal Association, was not pleased with the results. "Every day they want more and more coal production, then they put more and more roadblocks," Manasco said. "It's a difficult bill. We knew one was coming—we tried to make it work as well as possible. It will be hardest on small operators, and there's no question that it will cost more."

Karl Englund, an environmentalist who followed the legislation all through the 95th Congress for the Northern Plains Resource Council, was happy with the conference agreements on prime farmlands, elimination of highwalls and return to approximate original contours. But he was unhappy that small coal operators got a partial exemption and he complained that the provision on alluvial valley floors had been weakened.

The conference report on HR 2 was filed July 12 (H Rept 95-493, S Rept 95-337). Conferees noted that it was the third report in the last three Congresses on strip mining legislation. They said that the five years of legislative experience had resulted in substantially similar House and Senate bills.

Surface Owner Consent. The House required the written consent of surface owners before federally-owned coal beneath their lands could be strip mined. The Senate bill was similar, but a floor amendment gave the Interior Secretary the right to override the surface owner if leasing was in the national interest. The conference agreed to the House language.

Modifying House language on disputes arising when both the surface and mineral estates were in separate private ownership, conferees decided that the disputes should be settled by state law and state courts.

Alluvial Valley Floors. The House had banned mining on alluvial valley floors in the West unless permits had been obtained before enactment, and specified that mines were not to damage water systems that supplied valley floors. The Senate only restricted such mining, prohibiting it on most farmland but allowing it on undeveloped rangelands or small farmland if it would have a negligible impact on agricultural production. It also authorized the Interior Secretary to lease other federal coal deposits to coal operators who had made a substantial financial commitment to mine coal in alluvial valleys where mining would now be prohibited under the law.

The conference basically adopted the Senate provision, permitting mining of the valley floors if it did "not interrupt, discontinue or preclude farming," and authorized the coal exchange program.

Prime Farmlands. Before a strip mining permit could be issued, the Senate required demonstration that prime farmlands, as defined by the legislation, would be restored to full productivity. The House bill had no such provision. Conferees stipulated that permits could be granted if the applicant has "the technological capability to restore such mined area" to equivalent or higher productivity, and set soil reconstruction standards.

"Small Operators" Exemption. The Senate bill gave "small operators"—those producing 100,000 tons or less per year—an exemption from most environmental standards for 24 months after enactment of the legislation. The House allowed no similar exemption. Conferees shortened the exemption deadline to Jan. 1, 1979, and made sure the 100,000-ton limit applied per operator (not per mine) for both surface and underground coal.

Highwalls. In provisions on steep slope mining, the Senate had provided that spoil from the first cut could be placed below the strip bench. The House had no such provision and Senate conferees agreed to drop theirs. The Senate bill also allowed variances from requirements that highwalls be backfilled and the land be returned to approximate original contours. Conferees required that highwalls be backfilled but allowed a variance of the approximate original contours to permit a broad range of post-mining uses for lands left with very wide and stable benches.

Mountaintop Mining. Conferees melded provisions concerning the mining method called mountaintop removal. They permitted it, provided spoil disposal standards are met, if it provided for a better post-mining land use or if applicants submitted specific plans for post-mining land use.

Provisions

As sent to the President, HR 2, the Strip Mining Control and Reclamation Act of 1977:

Title I—Findings and Policy

- Found that surface mining operations adversely affect commerce and the public welfare by diminishing or destroying land use, polluting water, damaging natural beauty and habitats, and creating hazards to life and property.
- Found that expanded coal mining to meet the nation's energy needs required establishment of protective standards.
- Found that the primary responsibility for developing and enforcing regulations for surface mining and reclamation should rest with the states because of the diversity of terrain and other physical conditions.
- Recognized the need for national standards in order to eliminate competitive advantages or disadvantages in interstate commerce among sellers of coal.
- Called for reclamation of mined areas left unreclaimed before enactment of the act.

Title II—Office of Surface Mining

- Established an Office of Surface Mining Reclamation and Enforcement in the Interior Department; provided that its director be subject to Senate confirmation.
- Identified the specific duties of the office, including administering the act's regulatory and reclamation programs, approving and disapproving state programs, and providing grants and technical assistance to the states.

- Stipulated that there was to be no use of coal mine inspectors hired under the Federal Coal Mine Health and Safety Act of 1969 for strip mining inspection unless the director published a finding in the *Federal Register* that such activities would not interfere with inspections under the 1969 act.
- Directed the office to develop and maintain an Information and Data Center on Surface Coal Mining, Reclamation and Surface Impacts of Underground Mining to provide information to the public and other government agencies.
- Prohibited any federal employees who performed functions under the act from having a direct or indirect financial interest in coal mining operations and made violators subject to fines of up to $2,500, imprisonment of up to one year, or both.

Title III—State Mining Institutes

- Authorized each state to establish, or continue to support, a state mining and mineral resources research institute at a public or private college that would conduct research and train mineral engineers and scientists.
- Authorized for each participating state $200,000 in fiscal 1978, $300,000 in fiscal 1979, and $400,000 for each fiscal year thereafter for five years, to be matched by non-federal funds, to support the institutes.
- Authorized an additional $15-million in fiscal 1978, to be increased by $2-million in each fiscal year for six years, for specific mineral research and demonstration projects of industry-wide application at the mining institutes.
- Specified that the use of federal funds for the institutes did not authorize federal control or direction of education at any college or university.
- Established a center in the Interior Department for cataloging current and projected research on mining and mineral resources.
- Established an Advisory Committee on Mining and Mineral Research composed of representatives from the Bureau of Mines, National Science Foundation, National Academy of Sciences, National Academy of Engineering, U.S. Geological Survey and four other persons knowledgeable in the field, at least one of whom represented working coal miners.

Title IV—Abandoned Mine Reclamation

- Established within the U.S. Treasury a trust fund called the Abandoned Mine Reclamation Fund consisting primarily of amounts derived from the sale, lease or use of reclaimed land and from a reclamation fee of 35 cents per ton of surface mined coal and 15 cents per ton of underground mined coal (or 10 per cent of the value of coal at the mine, whichever was less), except that fees for lignite or brown coal were set at 2 per cent of the value of the coal or 10 cents per ton, whichever was less. Such fees were to be paid by 30 days after each calendar quarter ended.
- Provided that the fund be used to acquire and reclaim abandoned surface mines and deep mines, including sealing off tunnels and shafts. However, up to one-fifth of the fund would be transferred to the Agriculture Secretary for a rural lands reclamation program; up to 10 per cent, but not more than $10-million annually, was to be used for hydrologic planning and core drilling assistance on behalf of small mine operators.
- Provided that up to 50 per cent of the fees collected annually in any state or Indian reservation were to be allocated to that state or reservation for abandoned mine reclamation. But after reclamation was completed, the Secretary could allow use of the remainder of the 50 per cent for construction of public facilities in communities impacted by coal development—if certain specified federal payments were inadequate to meet the needs.
- Provided that the balance of reclamation funds could be spent in any state at the discretion of the Secretary for mine reclamation.
- Required the Secretary to set rules and regulations for state reclamation programs within 180 days of enactment. States having approved regulatory programs could submit reclamation plans for funding, including grants of up to 90 per cent for the cost of acquiring lands to be reclaimed.
- Authorized the Secretary of Agriculture to enter into agreements with small rural landowners of abandoned mines for land stabilization, erosion and sediment control, and reclamation. Landowners were to furnish conservation and development plans, and agree to effect the land uses and treatment outlined in the plans. Federal grants to carry out the plans were not to exceed 50 per cent of costs on not more than 120 acres, or lower amounts on up to 320 acres in certain instances, unless justified to enhance off-site water quality or to enable a landowner of limited income to participate.
- Gave the Interior Secretary and the states broad authority to study reclamation sites, acquire lands not already owned by the public, reclaim the land according to a cost-benefit analysis for each project, and determine use of the land after reclamation. For work done on private lands, the Secretary and the states were directed to establish a lien on the property after reclamation to the extent that the market value of the land was enhanced. Restored land could be sold by competitive bidding or added to the public lands.
- Authorized the Interior Secretary to construct public facilities necessary to a reclamation project that created public outdoor recreation areas.
- Provided for the filling of voids and the sealing of abandoned tunnels, shafts and entryways, and reclamation of other surface impacts of mining—not limited to coal mine impacts.
- Gave the Secretary power to use the fund for emergency abatement or prevention of adverse coal mining practices and gave him access to land where any such emergency existed.
- Authorized the transfer of abandoned mine reclamation funds to other federal agencies in order to carry out reclamation activities.

Title V—Environmental Control of Surface Mining

- Required the Interior Secretary to issue interim regulations for environmental standards within 90 days of enactment, and waived provisions of the National Environmental Policy Act of 1969. Permanent regulations were to be issued one year after enactment.
- Required approval of the administrator of the Environmental Protection Agency for regulations concerning air and water quality standards.
- Required all new mines within six months of enactment and all existing mines within nine months to comply with the interim standards. However, an exception was made for operators whose surface and underground mines combined produced no more than 100,000 tons per year; they were given until Jan. 1, 1979, to comply.
- Established a federal enforcement program within six months of enactment, to include at least one inspection for every mining site every six months.

- Set interim standards requiring surface mine operators to keep waste materials off steep slopes, return mined lands to their approximate original contour, preserve topsoil for reclamation, stabilize and revegetate waste piles, minimize disturbances to water tables, notify the public about blasting schedules and take certain prescribed safety precautions.
- Provided that within two months after approval of a state regulatory plan, or after implementation of a federal regulatory plan, all mine operators within a state had to apply for a permit to mine lands they expected to be working on eight months later. The state regulatory authority or the Secretary had to grant or deny a permit within eight months.
- Directed states that wished to assume jurisdiction over surface mining to submit state regulatory programs to the Secretary within 18 months of enactment, demonstrating that they had the legal, financial and administrative ability to carry out the act. Among other requirements, the state program was to provide sanctions for violations of state laws and establish a process for the designation of areas as unsuitable for surface mining.
- Directed the Secretary to approve or disapprove a state program. States were allowed 60 days to submit a new program if their first attempts were unsuccessful; the Secretary was required to rule on the resubmitted program in 60 days.
- Authorized the Secretary to implement a federal strip mining regulation program in any state that failed to submit a program within 18 months, or failed to resubmit an acceptable program within 60 days of federal disapproval, or otherwise failed to implement, enforce and maintain an approved program. Federal programs were to be implemented no more than 34 months after enactment, and following a public hearing in each affected state. A state could apply for approval of a new state program any time after implementation of a federal program.
- Allowed state programs to include more stringent environmental protection regulations than required by the act.
- Required surface mine operators to obtain a permit no more than eight months after approval of a state program or implementation of a federal program. Permits were to be issued for a period of five years, but could be extended if necessary for an operator to obtain financing. If mining operations did not begin within three years, under normal circumstances, the permit expired.
- Required that permit applications be accompanied by fees as determined by the regulatory authority.
- Required mine operators to submit detailed information with their applications, including the following: identification of all officials and corporations involved; history of the applicant's experience with past mining permits; a demonstration of compliance with public notice requirements; maps of the proposed mining area and land to be affected; description of the mining methods; starting and termination dates of each phase of the mining operation; schedules and methods for compliance with environmental standards; description of the hydrologic consequences of mining and reclamation; results of test borings; soil surveys if the mine might include prime farmlands; a blasting plan.
- Provided, for mining operations not expected to exceed 100,000 tons annually, free hydrologic studies and test boring analyses performed by qualified public or private laboratories designated and paid by the regulatory authority.
- Required proof of public liability insurance, or evidence of other state or federal self-insurance requirements, as part of a permit application.
- Required operators to submit a reclamation plan as part of their permit application.
- Required that reclamation plans submitted with permit applications must include the following information: identification of the area to be mined or affected; condition of the land prior to mining, including a description of the uses, topography and vegetation; the use to be made of the land following reclamation and how that use is to be achieved; description of the steps taken to minimize effects on renewable resources; engineering techniques for both mining and reclamation; consideration given to maximum recovery of coal to avoid reopening the mine later; estimated timetable for each reclamation step; measures to be taken to protect surface and ground water systems, and the rights of water users; confidential results of test boring.
- Prescribed the requirements for obtaining a performance bond of at least $10,000 covering the area to be mined within the term of the permit. Bonds, payable to federal or state authority, had to cover the full cost of reclamation. States were permitted to establish alternative systems in lieu of bonding programs, subject to federal approval.
- Provided that a mining permit could not be approved unless the regulatory authority found that all requirements of the act would be met, reclamation could be accomplished, damage to the hydrologic balance would be prevented, and the area to be mined was not one designated as unsuitable for mining—unless the operator showed that substantial legal and financial commitments were made before Jan. 1, 1977.
- Required findings that mining operations would not interrupt, discontinue or preclude farming on alluvial valley floors west of the 100th meridian, nor materially damage the quality or quantity of underground or surface water there. Exempted undeveloped rangeland and farmland of small acreage where mining would not adversely affect agricultural production. Also provided that the requirement did not apply to mines in commercial production or for which state permits had been granted during the year preceding enactment.
- Authorized the Secretary to lease other federal coal deposits in exchange to operators who had made "substantial financial and legal commitments" before Jan. 1, 1977, to alluvial valley mining outlawed under the act.
- Required, in cases where the private surface ownership and private mineral ownership were separate, the written consent of the surface owner for strip mining the property, or a conveyance that expressly granted the right. Disputes were to be settled under state law and in state courts.
- Permitted the mining of prime farmlands, as defined in the act, if the regulatory authority finds in writing that the mine operator has the technological capability to restore the area within a reasonable time to equal or higher farm productivity.
- Set terms for revision of permits when there was to be significant alteration in the permit plan.
- Prescribed standards for coal exploration, including reclamation requirements, and restricted exploration operations to removing 250 tons of coal.
- Established procedures for public notice and hearing of an applicant's intention to mine. Required the regulatory authority to hold public hearings if operators requested them or if serious objections were filed.

- Required the regulatory authority to rule on a permit application within 60 days if a public hearing is held, or "within a reasonable time" under other circumstances. Set procedures for appeals.
- Established in section 515 the performance standards for environmental protection, to apply to all surface coal mining and reclamation.
- Required operators to regrade mining sites to their approximate original contour in most instances and to eliminate highwalls, spoil piles and depressions. Regraded slopes had to assure mass stability and prevent surface erosion and water pollution.
- Directed operators to preserve, segregate and reuse topsoil taken from the mine site, protecting it from erosion and contamination. If prime agricultural areas were mined, operators had to provide in the regraded soil a root zone of comparable depth and quality to that of the natural soil.
- Allowed water impoundments as a part of reclamation if they met certain water quality and dam safety standards and if embankments were graded properly.
- Required operators to minimize disturbances to the hydrologic balance and to the quality and quantity of surface and underground water by avoiding acid and toxic mine drainage, preventing suspended solids from entering the stream flow, cleaning out and removing temporary settling and siltation ponds, preserving hydrologic functions of alluvial valley floor in arid regions, and avoiding channel enlargement in operations having a water discharge.
- Permitted permanent disposal of surplus spoil in areas other than mine workings (but within the permit area) if certain standards were met to stabilize the spoil mass, control surface erosion, provide internal drainage and take other precautions.
- Required operators to revegetate mined lands with cover native to the area, and to assume responsibility for revegetation for five years after the last seeding or planting. In areas having less than 26 inches of annual precipitation, the responsibility period was extended to 10 years.
- Prohibited surface mining within 500 feet of active or abandoned underground mining to protect the health or safety of miners. However, variances could be permitted if the mining efforts were coordinated and if they improved resource recovery.
- Prescribed conditions and standards for blasting, including advance notice of schedules.
- Permitted the mining practice known as mountaintop removal without regrading to its approximate original contour—although no highwalls were permitted—in certain cases when the proposed post-mining use of the land was an equal or better economic use, or when the applicant presented specific plans for the post-mining use.
- Required complete backfilling of all highwalls, but permitted a variance for certain operations that left a very wide and stable bench for post-mining land uses.
- Set standards for mining on slopes steeper than 20 degrees, including a prohibition against placing any spoil or other mining debris on the downslope below the bench (mining cut), and a requirement that highwalls be covered completely by backfilling and the land be returned to its approximate original contour.
- Set minimum environmental standards to control the surface impacts of underground mining operations. These included protection of surface land uses from subsidence hazards and protection of surface waters from mine discharges and drainage from mine waste piles. Required coordination in this effort between the Interior Secretary and the Administrator of the Mine Enforcement Safety Administration.
- Required inspections of each surface mining operation, without prior notice, to occur on the average of at least one partial inspection a month and one complete inspection every three months. Provided for rotation of inspectors and public availability of inspection reports.
- Established environmental monitoring procedures, with special procedures for operations that remove or disturb strata that serve as aquifers affecting the hydrologic balance either on or off the mining site.
- Placed tight restrictions on the financial interests any employee of a regulatory authority performing functions under the act might have in coal operations.
- Set civil penalties of up to $5,000 for each violation under Title V, and provided that each day of continuing violation could be deemed a separate violation for purposes of penalty assessments.
- Provided that any person who knowingly violates a condition of a permit, or makes a false statement on an application, could be fined up to $10,000 or imprisoned for one year, or both.
- Provided that civil and criminal provisions of state programs be no less stringent than such provisions in the act.
- Established procedures for the release of performance bonds.
- Set forth the standing and procedural rules to be applied to lawsuits brought under the act. Allowed citizens to bring suit against the United States or other government instrumentalities under the act, or against any person for violations of rules, regulations, orders or permits issued under the act—including violations that resulted in injury.
- Gave primary responsibility for enforcing state programs to the states, but allowed the Interior Secretary to reinforce that authority with federal action following public hearings.
- Gave the Secretary authority to stop a mining operation immediately if it posed an imminent danger to public health or safety or might cause irreparable damage to the environment.
- Required states to establish plans for designating lands unsuitable for surface mining. The designation was required if land could not be reclamed under requirements of the act. All other designations were discretionary with the regulatory authority, but lands could be deemed unsuitable if: strip mining would be incompatible with government objectives; the lands are fragile or historic; the site is a natural hazard area where development could endanger life or property; the area contains renewable resources where development would result in a loss of long-range productive capacity.
- Exempted unsuitable lands on which surface mining operations were being conducted on the date of enactment, or where substantial legal and financial commitments in such operations were made prior to Jan. 4, 1977.
- Directed the Secretary to review federal lands to determine which were unsuitable for surface mining. Existing operations on federal lands were allowed to continue until completion of the review.
- Prohibited strip mining operations in the National Park System, National Wildlife Refuge System, National System of Trails, National Wilderness Preservation System, Wild and Scenic Rivers System, or Custer National Forest.
- Permitted surface mining in other national forests if the Secretary found there were no significant recreational,

timber, economic or other values that might be incompatible with such operations, and where surface operations were incident to underground mines and where the Agriculture Secretary determined that surface mining in areas west of the 100th meridian having sparse forest cover would be in compliance with existing law.

- Required the Interior Secretary to promulgate a program for federal lands within one year of enactment, incorporating all requirements of the act.
- Authorized the Secretary to enter into a cooperative agreement with a state for state regulation of strip mining on federal lands, provided that the Secretary retained authority to approve or disapprove mining plans and to designate federal lands as unsuitable for surface coal mining.
- Required all public agencies, public utilities and public corporations to comply with the environmental protection standards of Title V.
- Provided for judicial review in the appropriate U.S. District Courts of the Secretary's decisions regarding approval or disapproval of state programs.
- Authorized separate regulations for bituminous coal mines in the West which were in production prior to Jan. 1, 1972, and which met special criteria.
- Authorized the Secretary to issue separate regulations for anthracite coal surface mines if such mines were regulated by environmental protection standards of the state.

Title VI—Lands Unsuitable for Non-Coal Mining

- Permitted the Secretary of Interior, if requested by a state governor, to review any federal land within a state to assess whether it was unsuitable for mining for minerals other than coal.
- Authorized designation of any area as unsuitable if it were predominantly urban or suburban or if a mining operation would have an adverse impact on lands used primarily for residential purposes. The provision would not apply to any lands already being mined.
- Permitted any person with an interest which might be adversely affected to petition for exclusion of such an area from mining activities.

Title VII—Miscellaneous Provisions

- Defined technical terms and descriptions used throughout the act.
- Exempted coal owned by the Tennessee Valley Authority from the surface owner and federal lessee protection requirements applicable to other federal coal, but authorized the Secretary to set guidelines for mining TVA-owned coal.
- Made it unlawful to discharge or discriminate against an employee for filing suit or testifying under provisions of the act.
- Made it a criminal violation to resist or impede investigations carried out by a regulatory authority under the act.
- Authorized the Secretary to make grants to the states to develop and implement state regulatory programs. Grants could be up to 80 per cent the first year, 60 per cent the second year, and 50 per cent each year thereafter.
- Required the Secretary to report annually to the President and Congress on activities under the act.
- Authorized the Secretary to modify application of environmental protection provisions of the act to Alaskan surface mines for up to three years if he decided that was necessary to continue operation of the mines. Required the Secretary to make a study of strip mining conditions in Alaska and report to Congress within two years and authorized $250,000 for the study.
- Mandated a study within 18 months of enactment concerning surface and open pit mining and reclamation technologies for minerals other than coal, with emphasis on oil shale and tar sands deposits in western states. Authorized $500,000 for the study.
- Required a special study of surface mining regulation on Indian lands, and authorized $700,000 to assist the Indian tribes in the study.
- Permitted departures from environmental performance standards for mining and reclamation on an experimental basis, in order to allow post-mining land use for industrial commercial, residential or public use, including recreation.
- Authorized $10-million a year for fiscal 1978 through fiscal 1980 for initial regulatory procedures and administration of the program; $10-million each year for 15 years beginning in fiscal 1978 for hydrologic studies and test borings for small mine operations; $20-million in fiscal 1978 and $30-million each in fiscal 1979 and 1980 for grants to the states in preparing their regulatory plans. It also authorized up to $2-million in fiscal 1977 for the Secretary to begin implementing the act.
- Provided that surface owners, as defined by the act, must give their written consent before the Secretary could lease federally owned coal beneath the land they lived and worked on.
- Provided, in cases where the surface above federally owned coal was subject to a federal lease or permit, that there must be either written consent of the lessee or permittee, or evidence of bonding for payment of damages to the lessee or permittee.

Title VIII—University Coal Research Laboratories

- Authorized the Administrator of the Energy Research and Development Administration to designate 10 institutions of higher education for establishing university coal research laboratories.
- Authorized the administrator to make grants of up to $6-million for initial costs, and up to $1.5-million annually for operating expenses for each institution.
- Established an 11-member Advisory Council on Coal Research to help administer the title.
- Authorized appropriations of $30-million for fiscal 1979, and $7.5-million annually for fiscal years 1980-1983.

Title IX—Energy Resource Graduate Fellowships

- Authorized the Administrator of the Energy Research and Development Administration to award up to 1,000 graduate fellowships annually in fiscal years 1979-1984 for study and research in applied science and engineering related to the production, conservation and use of fuels and energy.
- Set terms and conditions of the fellowships.
- Authorized appropriations of $11-million for each of the six fiscal years.
- Authorized the Interior Secretary to conduct and promote research and demonstration projects of alternative coal mining technologies.
- Authorized annual appropriations of $35-million for fiscal years 1979-1983.

—By James R. Wagner

Attachment 4

STATEMENT BY JACK GLAVES
900 O. W. Garvey Building, Wichita, Kansas 67202
Submitted to SPECIAL LEGISLATIVE COMMITTEE ON ENERGY
August 22, 1977
in behalf of PANHANDLE EASTERN PIPE LINE COMPANY

I am sure the first concern of this Committee is what is the relationship of Senate Bill 420 with the objective of the Committee in studying proposals that will aid additional exploration for oil and gas in Kansas.

We submit that the failure to adopt the concept of this bill, as well as the inability to obtain prospective spacing for the protection of acreage around an exploratory well, has contributed to the lack of exploration for both oil and gas in Kansas. It should be kept in mind that presently a royalty interest that for any reason cannot be leased, or the owner of an oil and gas lease covering however small a tract in an area that is a prospective well location, can effectively thwart the drilling of a well by simply refusing to sign an oil and gas lease or participate in the drilling of a well in the case of a working interest owner. It may be said that this is an inalienable property right and so be it. This, of course, is the old law of capture that prevailed in the days before it was recognized that we must conserve our oil and gas resources and that in order to produce the maximum amount of recoverable oil and gas, and to distribute the proceeds of such production in an equitable manner, there must be a method of combining the interests into a producing unit that will avoid the drilling of unnecessary wells and, at the same time, permit the recovery of the maximum amount of recoverable oil or gas from each well drilled. These principles are even more important today than in past periods because of the tremendous increase that has occurred in the cost of drilling a well, and, of course, in light of the critical need to recover all the oil and gas that we can under today's technology.

We have to keep in mind that oil and gas are capable of moving across lease lines. It is not like mining a hard mineral which doesn't disturb mineral ownership of adjoining owners. Given the fugacious nature of oil and gas, it is clearly appropriate for the State under its police power, to regulate the location of wells and to provide for the division of the proceeds from production. That is the theory of the pooling laws that have been enacted in all of the major producing states except Kansas. I know that some contend that it is too late for the concept of this bill to be of value in additional exploration in Kansas, but I believe that when we compare the activity in the neighboring state of Oklahoma which has had a spacing and pooling law since 1947, we can realize the potential significance of these laws on Kansas operations. The increase in the value of oil and gas production has, of course, resulted in a significant increase in the number of wells drilled all over the United States. I am attaching a report that is compiled by the Hughes Tool Company of rig activity as of August 1, 1977, which compares the prior year, month and week. Kansas had 69 rigs running, with an increase from 57 in August of 1976. Oklahoma had 241 rigs running on August 1, 1977 compared to 172 on August 2, 1976. Even though Kansas is considered a major oil and gas producer, we only have about 3 per cent of the rigs that were active on August 1, 1977 in the United States. What is the relationship of the relatively large number of rigs running in Oklahoma to the fact they have effective spacing and pooling laws?

I have reviewed a compilation by the Oklahoma Corporation Commission which sets forth the yearly comparison of the number of applications filed for pooling and spacing from 1958 through 1976. The number of pooling applications has increased from 72 in 1958 to 1261 in 1976. The number of spacing applications has increased from 254 in 1958 to 1235 in 1976. I am also attaching a list of applications that were filed for the week of June 21, 1977 with the Oklahoma Commission. This will give you an idea of the type of companies that seek to utilize Oklahoma's pooling and spacing law. I note that on pooling applications

alone in the four days of that week that are shown on the court calendar, there were 64 applications filed; all by independent operators, which averaged 13 applications a day. I have examined other calendars and notice that in the week of July 25 there were 73 that were filed, which was 12 applications a day; 68 of them by independents and 5 by major companies. I have the calendar for the week of July 5, which indicates 77 filings for pooling alone, with 69 of them by independents and 8 by the majors--which was an average of 19 a day for that 4-day week.

It is obvious that the Oklahoma law is being utilized by their operators and unquestionably it is a vehicle which contributes to the significant exploration that is occurring there.

Kansas needs a well spacing law, permitting the Commission to establish wide spacing with location restrictions, for the surrounding area of a proposed exploratory well prior to drilling, with the power to reform the units as development dictates. Secondly, we need a compulsory pooling or unitization law, which is really what S.B. 420 addresses, which will permit the drilling of a well even though the operator is not able to secure the consent of all royalty or other lessees that would otherwise be required for such exploration. This is necessary in order to assure orderly development and indeed any development in many instances. Under the present law, it is completely possible for one minute interest holder to thwart development by simply refusing to lease in the event of a royalty owner, or refusing to participate in the drilling of a well in the event of a working interest owner, who holds the lease on a portion of the land sought to be included in the drilling unit.

For a legislative history of this issue, I would refer you to the 1961 proposal No. 23, which related to three facets of the oil and gas industry, namely (1) well spacing, (2) pooling or integration of leases in a spacing unit, and (3) field-wide unitization of an entire pool for secondary recovery purposes. Over 250 pages of transcribed tape recording covering all points of view were had in the study of that proposal, and I quote from the report by Chairman Ross Doyen in connection with this study by the Committee on Labor and Industries, to-wit:

> "We find that much is being done voluntarily to improve the present situation, but that there remains areas which are at present beyond the jurisdiction of the State's Corporation Commission, which continue to permit wasteful methods of recovery of oil and gas, and frequently retention in the ground of much unrecovered resources, while in addition, failing to develop resources of Kansas to the point of giving Kansas its fair share of the oil and gas market. Kansas and Texas, out of the top 12 producing states, are the only two which do not have this type of legislation, and Texas will give serious consideration to a similar proposal in the 1963 legislature."

Texas, in fact, enacted its Mineral Interest Pooling Act in 1965.

As a result of the study, House Bills 172 and Senate Bill 274 were introduced in the 1963 session, and a major effort was made to implement the recommendations of the Study Committee. These bills provided for establishment of well-spacing units, and pooling or integration of leases in a spacing unit, and field-wide unitization of an entire pool for secondary recovery purposes. The effort failed.

In the 1967 Session, much of Section 5 of the original bills which pertained to unit operations of a pool for secondary recovery purposes was adopted, and is now incorporated into K.S.A. 55-1301, et seq. In the 1968 Session, H.B. 1783 was introduced by the Committee on Oil and Gas, which sought to implement the remaining two facets of the original study, i.e., well spacing

and pooling or unitization of leases in the drilling units. This bill passed the House, 91-14, but apparently died in the Senate Committee on Oil and Gas.

The principal difference between the 1968 proposal and the 1963 bills, except, of course, for deletion of field-wide unitization, was that the 1968 proposal permitted the establishment of drilling units for wells to be drilled, whereas, the prior bills only permitted spacing and unitization after the drilling of the discovery well. This bill was not specific as to how drilling units are established, but simply proceeds on the premise that the Commission has such authority, which actually does not exist prior to successful exploration. I would suggest that serious study be given to the Oklahoma law (which I am attaching hereto), which empowers the Commission to establish well spacing and drilling units as to any common source of supply or prospective common source of supply of oil or gas within the state, and further specifically provides for the reforming of such units after additional development indicates such reformation is necessary to protect the rights of the interested parties. (Title 52,Sec.87.1,O.S.A.)

Senate Bill 420 defines a "drilling unit" as a "spacing unit established by order of the Commission for wells drilled or to be drilled in a spaced pool..." (sec. 2 of the Bill), "such spacing having been determined by the Commission as the area that may be economically and efficiently drained by one well."

It would seem that this language presupposes that the Commission has theretofore had a hearing determing what the drainage area is for a well that has then been drilled, and the pool has already been spaced under existing law. I do not believe that the language would permit establishment of a spacing unit prior to the drilling of the discovery well. We believe that it is much more

logical and would be more useful to permit relatively wide spacing for protection of those who are going to invest their money in the prospective well prior to the risking of the funds. This is what is permitted by the Oklahoma law, and of course, if it turns out that the spacing is not proper, the Commission should have the authority to reform the unit as above noted.

Although our law should be tailored to fit the existing law and our particular needs, I believe that the successful experience in the use of the Oklahoma law indicates the wisdom of looking to it, at least for general direction in adopting a law for our state. It is noted that the pooling portion of the Oklahoma law commences with the ninth line of Subsection (d), Title 52, Sec. 87.1, which commences "when two or more separately-owned tracts of land..."--this being comparable language to the beginning of Sec. 3 of S.B. 420. It is noted that the Oklahoma law does not detail the requirements of the contents of the application, nor the specific provisions of the Commission's order as required by Sections 4 and 5 of S.B.420. With respect to the contents of the application, Subparagraph (b) is, of course, inconsistent with the prospective application of the law for exploratory wells, and I would question the necessity for an allegation of the details of voluntary unitization efforts, as provided in subparagraphs (c) and (d). The Commission in any event is going to have the responsibility of determining what the just and reasonable unit and division of production is, and the pleading of negotiations that may have occurred, the failure of which causes the filing of the application, seems inappropriate. It is noted that in lieu of the detailed provisions of the order as provided in Section 5, the comparable provision of the Oklahoma law is simply:

> "such pooling order of the Commission shall make definite provisions for the payment of costs of development and operation, which shall be limited to the actual expenditures required for such purpose, not in excess of what are reasonable, including a reasonable charge for supervision. In the event of any dispute relating to such costs, the Commission shall determine the proper costs after due notice to interested parties and a hearing thereon."

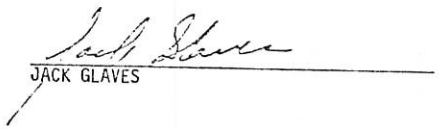
The first paragraph of Sec. 6 of the Bill is quite appropriate, and needful. In fact, I would have no argument with the remainder of Sec. 6, except perhaps question the necessity for the Commission to adjudicate disputes concerning who should be the operator of the lease. Likewise, I would have no adverse comment with respect to the provisions of Secs. 7 or 8, although it might be that the Commission would prefer that the costs of a consultant should be paid by the disputants, rather than out of the funds of the Commission, but I trust the Commission will be heard on that issue. With respect to the notice required by Sec. 9, it seems rather detailed and inflexible, and it would seem that the Commission should simply require such reasonable notice as it deems appropriate consistent with the requirements of due process. I am sure that there could be situations where leases are expiring, and time is very much of the essence in getting the procedure expedited. It would seem that the Commission should have authority to declare an emergency and waive the 15-day requirement. In all, this might be an area more appropriate for Commission Rule and Regulation, rather than a statutory provision.

In conclusion I would submit that the legitimate private interest needing legal protection is assurance that every mineral owner has an equal opportunity to recover the minerals underlying his particular tract, but no more nor no less. The public interest requires that oil and gas be produced without waste, without impairment of correlative rights in a manner which will achieve the maximum ultimate recovery, and with incentives for efficient and economical methods of operation. There is no real conflict between these two objectives, once they are properly defined. The pooling of small tracts for an undivided interest in a single well doesn't violate any principle of legal or business tradition. It protects both private and public interests and embodies recognized engineering principles and conforms with operating practices widely and successfully used everywhere except in Kansas. It conserves capital for the industry in that it avoids the drilling of unnecessary wells and promotes

the orderly development that is required to protect the rights of the royalty owners and working interest owners alike. I believe that a bill providing for spacing prior to drilling, with the power of the Commission to modify such spacing and well location requirement as future development dictates, together with the power of the Commission to require unitization on a drilling or spacing unit basis, with appropriate provisions for sharing of production and costs of such drilling and development, will spur additional development in Kansas, consistent with what is happening in other states with these statutory provisions.

We believe that these concepts are wholly consistent with the charge of this Committee to explore statutory changes that will encourage exploration and development for oil and gas resources. We commend you for studying this proposal.

Respectfully submitted,



JACK GLAVES

ACTIVE RIG STATISTICS

	Aug. 1, 1977	Change From Previous Week	July 8, 1977	Aug. 2, 1976
Alabama	14	—	13	18
Alaska	19	—	7	9
Arkansas	15	— 1	15	15
California	95	+ 5	91	88
Colorado	53	+ 3	54	40
Florida	5	—	5	5
Illinois	14	—	15	23
Indiana	3	+ 1	4	1
Iowa	2	—	2	0
Kansas	69	— 1	71	57
Kentucky	2	+ 2	1	0
Louisiana-Offshore	113	— 3	107	83
Louisiana-Total	300	+ 7	285	217
Maryland	1	—	1	1
Michigan	26	— 1	23	24
Mississippi	42	+ 1	43	34
Montana	29	— 4	25	29
Nebraska	10	— 1	10	6
Nevada	2	—	3	3
New Mexico	77	+ 3	71	56
New York	8	—	9	11
North Dakota	26	+ 4	22	19
Ohio	37	—	38	29
Oklahoma	241	— 9	245	172
Oregon	1	—	1	1
Pennsylvania	16	— 1	16	9
Rhode Island-Offshore	1	—	1	0
South Dakota	3	+ 2	2	1
Texas Offshore	45	+ 3	50	37
Texas-Total	790	+ 20	734	636
Utah	34	— 1	29	10
Virginia	1	— 1	1	0
West Virginia	19	+ 1	14	18
Wyoming	118	— 3	116	93
Total-United States	2067	+ 25	2037	1634
Western Canada	218	+ 12	217	182

Domestic drilling activity was at an 18 year high for the second straight week last week with 2,067 rigs making hole, 25 above the previous week. The count was the highest since 2,117 active rigs were reported on Dec. 21, 1959. Oklahoma activity last week decreased by nine rigs compared to the previous week but Texas increased its rig count by 20, the best in the nation. It was the seventh consecutive week in which the national total broke the 2,000 mark.

Source: Reported to International Association of Drilling Contractors by Hughes Tool Co.

TUESDAY — COURT CALENDAR — JUNE 21, 1977

BEFORE THE TRIAL EXAMINER - 9:00 A.M.

C.D. 48970	SAMSON RESOURCES CO. Sec. 15-5N-17E	SPACING	LATIMER CO.
C.D. 48971	SAMSON RESOURCES CO. Sec. 15-5N-17E	POOLING	LATIMER CO.
C.D. 48965	KENNEDY & MITCHELL, INC. Sec. 24-25N-22W	SPACING	HARPER CO.
C.D. 48966	KENNEDY & MITCHELL, INC. Sec. 24-25N-22W	LOC EXCEP	HARPER CO.
C.D. 48996	HELMERICH & PAYNE, INC. Sec. 7-7N-7W	POOLING	GRADY CO.
C.D. 49002	DAVIS OIL CO. Sec. 9-13N-26W	POOLING	ROGER MILLS CO.
C.D. 49003	SAMSON RESOURCES CO. Sec. 7-7N-7W	SPACING	GRADY CO.
C.D. 49004	SAMSON RESOURCES CO. Sec. 7-7N-7W	POOLING	GRADY CO.
C.D. 49005	R. L. BURNS CORP. Sec. 27-6S-7E	SPACING	BRYAN CO.
C.D. 49006	R. L. BURNS CORP. Sec. 27-6S-7E	POOLING	BRYAN CO.
C.D. 49014	TEXAS OIL & GAS CORP. Sec. 29-9N-20E	SPACING	HASKELL CO.
C.D. 49015	TEXAS OIL & GAS CORP. Sec. 29-9N-20E	POOLING	HASKELL CO.
C.D. 49017	HELMERICH & PAYNE, INC. Sec. 7,18-7N-7W	SPACING	GRADY CO.
C.D. 49024	HELMERICH & PAYNE, INC. Sec. 7-7N-7W	POOLING	GRADY CO.
C.D. 49033	SOVEREIGN EXPLORATION CO. Sec. 21-2N-27ECM	POOLING	BEAVER CO.
C.D. 49023	EASON OIL CO. Sec. 30-10N-10W	LOC EXCEP	CADDO CO.
C.D. 49045	SHOELL OIL & GAS, INC. Sec. 33-3N-20ECM	POOLING	BEAVER CO.
C.D. 49031	TEXAS OIL & GAS CORP. Sec. 30-17N-12W	POOLING	BLAINE CO.
C.D. 49032	TEXAS OIL & GAS CORP. Sec. 26-17N-12W	POOLING	BLAINE CO.
C.D. 49055	VIRGIL R. CLOER Sec. 5-9N-14E	POOLING	MCINTOSH CO.
C.D. 49064	DAVIS OIL CO. Sec. 23,24,25,26-18N-26W	SPACING	ELLIS CO. Sec. 18,19,29,30-18N-25W
C.D. 49080	L. O. WARD Sec. 12-20N-15W	SPACING	KINGFISHER CO. (CHCA)
C.D. 48857	LEFTRAK OIL & GAS ORGANIZATION Sec. 35-18N-13W	POOLING	BLAINE CO.
C.D. 49091	DAVIS OIL CO. Sec. 23-18N-22W	POOLING	ELLIS CO.
C.D. 49062	HANSON OHIO OIL CO. Sec. 11-18N-17W	ALLOW	DEWEY CO.
C.D. 49086	WESSELY EXPLORATION, INC. Sec. 29-17N-19W	LOC EXCEP	DEWEY CO.
C.D. 49087	WESSELY ENERGY CORP. Sec. 3-16N-19W	LOC EXCEP	DEWEY CO.
C.D. 49088	WESSELY EXPLORATION, INC. Sec. 29-17N-19W	POOLING	DEWEY CO.
C.D. 48860	TEXAS OIL & GAS CORP. (Amended) Sec. 22-27N-16W	POOLING	WOODS CO.
C.D. 49139	UNIT DRILLING CO. Sec. 4-20N-25W	LOC EXCEP	ELLIS CO.
C.D. 49151	CIMARRON PETROLEUM CORP. Sec. 12-4N-6E	POOLING	POTTAWATOMIE CO.
C.D. 49159	CITIES OIL & GAS, INC. Sec. 1-16N-14W	LOC EXCEP	DEWEY CO.
C.D. 49175	R. CLARK TAYLOR Sec. 11-1N-11E	POOLING	COAL CO.
C.D. 49176	PAN HICKS, JR. Sec. 33-14N-10W	POOLING	CANADIAN CO.

1:30 P.M.

P.D. 8315	SAM F. SHANKLY Sec. 27-10N-15E	ENT ORDERS	MCINTOSH CO.
P.D. 8316	SAM F. SHANKLY Sec. 8-15N-13E	ENT ORDERS	OKMULGEE CO.
P.D. 8319	DAN R. PUDNETT Sec. 23,24-13N-12E	FILG WELLS	OKMULGEE CO.
P.D. 8328	DAN R. PUDNETT Sec. 23,24-13N-12E	FILG WELLS	OKMULGEE CO.
P.D. 8338	TEXACO, INC. Sec. 3-17N-5W	EXCEP RULE	KINGFISHER CO. (CHCA)

CONTINUED CASES BEFORE TRIAL EXAMINER - 9:00 A.M.

C.D. 48857	LEFTRAK OIL & GAS ORGANIZATION Sec. 35-18N-13W	POOLING	BLAINE CO.
C.D. 48860	TEXAS OIL & GAS CORP. Sec. 22-27N-16W	POOLING	WOODS CO.

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WEDNESDAY — COURT CALENDAR — JUNE 22, 1977

BEFORE THE TRIAL EXAMINER - 9:00 A.M.

C.D. 48381	LEAR PETROLEUM CORP. Sec. 13,14,24-20N-14W	SPACING	MAJOR CO.
C.D. 48978	LEEC EXPLORATION CO. Sec. 2,3,4-26N-18W	SPACING	WOODS & WOODWARD Sec. 19,20,29,30 thru 34-27N-18W Sec. 23 thru 26, 35,36-27N-19W
C.D. 48979	LEEDE EXPLORATION CO. Sec. 34-27N-18W	POOLING	WOODS & WOODWARD

CONTINUED

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June - 21
Wed - 19
Thurs - 13

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C.D. 49039	HARRY L. WERICK, JR. Sec. 4,5-2N-4E Sec. 32-3N-4E	SPACING	POTTAWATOMIE CO.
C.D. 49040	HARRY L. WERICK, JR. Sec. 5-2N-4E	POOLING	POTTAWATOMIE CO.
C.D. 49056	NEAL C. PARKER & BILL BOSTON Sec. 15-20N-14W	SPACING	MAJOR CO.
C.D. 49068	BLACK CORP. Sec. 20-29N-13W	SPACING	WOODS CO.
C.D. 49069	BLACK CORP. Sec. 20-29N-13W	LOC EXCEP	WOODS CO.
C.D. 49081	PENINSULA RESOURCES CORP. Sec. 32,33-24N-6W	SPACING	GARFIELD CO.
C.D. 49096	RATLIFF DRILLING CO. Sec. 15,16,21,22-1S-7W	SPACING	STEPHENS CO.
C.D. 49108	LOGAR OIL CO., INC. Sec. 10-18N-4W	LOC EXCEP	LOGAN CO.
C.D. 49109	KENNEDY & MITCHELL, INC. Sec. 30-4N-25ECM	LOC EXCEP	BEAVER CO.
C.D. 49110	KENNEDY & MITCHELL, INC. Sec. 34-5N-21ECM	POOLING	BEAVER CO.
C.D. 49113	NTC PETROLEUM CORP. Sec. 18-3N-12E	LOC EXCEP	PITTSBURG CO.
C.D. 49114	NTC PETROLEUM CORP. Sec. 8-3N-12E	LOC EXCEP	PITTSBURG CO.
C.D. 49115	NTC PETROLEUM CORP. Sec. 30-23N-13W	POOLING	WOODS CO.
C.D. 49116	JERRY L. PITMAN Sec. 33-13N-10E	POOLING	OKFUSKEE CO.
C.D. 49117	SOUTHPORT EXPLORATION, INC. Sec. 2-21N-20W	POOLING	WOODWARD CO.
C.D. 49118	CLEMENTS EXPLORATION, INC. Sec. 35-29N-14W	LOC EXCEP	WOODS CO.
C.D. 49119	CLEMENTS EXPLORATION, INC. Sec. 36-29N-14W	POOLING	WOODS CO.
C.D. 49131	TEXAS OIL & GAS CORP. Sec. 10-9N-21E	POOLING	HASKELL CO.
C.D. 49140	COLBY PRODUCTION CO. Sec. 8-5N-6W	SPACING	GRADY CO.
C.D. 49142	MARLIN OIL CORP. Sec. 9-5N-24ECM	LOC EXCEP	BEAVER CO.
C.D. 49143	UNIT DRILLING CO. Sec. 4-2N-5W	POOLING	ELLIS CO.
C.D. 49144	UNIT DRILLING CO. Sec. 24-17N-13W	POOLING	BLAINE CO.
C.D. 49160	ROSE REALTY & DEVELOPING, INC. Sec. 8-9N-21E	POOLING	HASKELL CO.
C.D. 49161	SOUTHPORT EXPLORATION, INC. Sec. 31-21N-20W	POOLING	WOODWARD CO.
C.D. 49162	REX R. [illegible], JR. Sec. 9-14N-2E	POOLING	LINCOLN CO.
C.D. 49166	[illegible] CORP. Sec. 19-15N-7W	LOC EXCEP	KINGFISHER CO.
C.D. 49167	FAUST EXPLORATIONS, INC. Sec. 3-9N-5E	LOC EXCEP	SEMINOLE CO.
C.D. 49168	BILL G. CAMPBELL Sec. 25-5N-6E	POOLING	PONTOTOC CO.
C.D. 49172	BOWAY OIL CO. Sec. 2-18N-3W	POOLING	LOGAN CO.
C.D. 49177	HARVEY GEORGE KAISER Sec. 5-6N-6W	LOC EXCEP	GRADY CO.
C.D. 49180	FILON EXPLORATION CORP. Sec. 34-20N-26W	POOLING	ELLIS CO.
C.D. 49181	FILON EXPLORATION CORP. Sec. 15-16N-14W	POOLING	DEWEY CO.

CONTINUED CASES BEFORE TRIAL EXAMINER - 9:00 A.M.

C.D. 48544	J. L. MILLS & ADELE MILLS Sec. 9,15,16,17,20,21,22,28,29-7N-4E	VAC ORDER	POTTAWATOMIE CO.
C.D. 48635	JERRY CHAMBERS-OIL PRODUCER Sec. 20-14N-13W	POOLING	BLAINE CO. (DMDA)
C.D. 48636	JERRY CHAMBERS-OIL PRODUCER Sec. 19-15N-14W	POOLING	CUSTER CO.
C.D. 48736	LYNX CORPORATION Sec. 34-19N-6W	SPACING	KINGFISHER CO.
C.D. 48546	L. O. WARD Sec. 2-18N-15W	SPACING	DEWEY CO.
C.D. 48764	HANOVER MANAGEMENT CO. Sec. 20-22N-23W	LOC EXCEP	ELLIS CO.
C.D. 48558	JOSH A. COLE, ET AL Sec. 17,18,19,30-21N-8W	SPACING	GARFIELD CO.

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BEFORE THE TRIAL EXAMINER - 9:00 A.M.

C.D. 49089	HELKE EXPLORATION CO. Sec. 21-23N-7W	SPACING	GARFIELD CO.
C.D. 48479	MORTON (MORAN PETROLEUM CO (Amended)	POOLING	WICHITA CO.
	Sec. 19-3N-19W		
C.D. 49101	J. T. HOKE, JR. Sec. 15-16N-2W	SPACING	LOGAN CO.
C.D. 49102	J. T. HOKE, JR. Sec. 15-16N-2W	LOC EXCEP	LOGAN CO.
C.D. 49103	J. T. HOKE, JR. Sec. 15-16N-2W	POOLING	LOGAN CO.
C.D. 49104	HCM Sec. 25,26-11N-9W	SPACING	CANADIAN CO.

CONTINUED

(2)

§ 59. Domestic pipe line companies have right of way

1. Injuries

Even assuming that failure of contractors, whose digging machine struck underground pipeline at air force base, to inform pipeline company of incident was the proximate cause of company's ensuing excavation expense incurred in locating point of damage, the contractors breached no contractual duty owed the company, since pipeline right-of-way easement granted by government imposed duty to inform on government, not public at large, and the contractors did inform a government representative of the incident. Magnolia Pipe Line Co. v. Cowen, Okl., 477 P.2d 845 (1970).

CHAPTER 8.—CONSERVATION OF OIL AND GAS

Sec.

154. Compilation of data to determine actual known oil and gas reserves—Legislation—Compensation of members [New].

§ 80.2 Waste of oil—Defined—Prohibited—Prevention—Protection of fresh water strata and oil or gas bearing strata

4. Power of commission

When owners executed oil and gas lease, their right to drill on leased premises for purpose of producing oil or gas passed to lessees whose rights to drill on leased premises were limited by proper exercise of state's police power. Sunray DX Oil Co. v. Cole, Okl., 461 P.2d 245 (1969), certiorari denied 90 S.Ct. 223, 396 U.S. 967, 24 L.Ed.2d 183.

§ 80.3 Waste of gas—Meaning—Prevention—Prohibition—Protection of fresh water and oil or gas bearing strata

2. Power of commission

When owners executed oil and gas lease, their right to drill on leased premises for purpose of producing oil or gas passed to lessees whose rights to drill on leased premises were limited by proper exercise of state's police power. Sunray DX Oil Co. v. Cole, Okl., 461 P.2d 245 (1969), certiorari denied 90 S.Ct. 223, 396 U.S. 967, 24 L.Ed.2d 183.

§ 87.1 Common source of supply of oil—Well spacing and drilling units

Whenever the production from any common source of supply of oil or natural gas in this state can be obtained only under conditions constituting waste or drainage not compensated by counter drainage, then any person having the right to drill into and produce from such common source of supply may, except as otherwise authorized or in this section provided, take therefrom only such proportion of the oil or natural gas that may be produced therefrom without waste or without such drainage as the productive capacity of the well or wells of any such person considered with the acreage properly assignable to each such well bears to the total productive capacities of the wells in such common source of supply considered with the acreage properly assignable to each well therein.

(a) To prevent or to assist in preventing the various types of waste of oil or gas prohibited by statute, or any of said wastes, or to protect or assist in protecting the correlative rights of interested parties, the Commission, upon a proper application and notice given as hereinafter provided, and after a hearing as provided in said notice, shall have the power to establish well spacing and drilling units of specified and approximately uniform size and shape covering any common source of supply, or prospective common source of supply, of oil or gas within the State of Oklahoma; provided, that the Commission may authorize the drilling of an additional well or wells on any spacing and drilling unit or units or any portion or portions thereof or may establish, reestablish, or reform well spacing and drilling units of different sizes and shapes when the Commission determines that a common source of supply contains predominantly oil underlying an area or areas and contains predominantly gas underlying a different area or areas; provided further that the units in the predominantly oil area or areas shall be of approximately uniform size and shape, and the units in the predominantly gas area or areas shall be of approximately uniform size and shape, except that the units in the gas area or areas may be of nonuniform size and shape when they adjoin the units in the oil area or areas; provided further that the drilling pattern for such nonuniform units need not be uniform, and provided further that

the Commission shall adjust the allowable production within said common source of supply, or any part thereof, and take such other action as may be necessary to protect the rights of interested parties. Any order issued pursuant to the provisions hereof may be entered after a hearing upon the petition of any person owning an interest in the minerals in lands embraced within such common source of supply, or the right to drill a well for oil or gas on the lands embraced within such common source of supply, or on the petition of the Conservation Officer of the State of Oklahoma. When such a petition is filed with the Commission, the Commission shall give at least fifteen (15) days' notice of the hearing to be held upon such petition by one publication, at least fifteen (15) days prior to said hearing, in some newspaper of general circulation printed in Oklahoma City, Oklahoma, and by one publication, at least fifteen (15) days prior to the date of said hearing, in some newspaper printed in the county, or in each county, if there be more than one, in which the lands embraced within the application are situated. Except as to the notice of hearing on such a petition, the procedural requirements of Sections 84 to 135, inclusive, of Title 52, Oklahoma Statutes shall govern all proceedings and hearing provided for by this section.

(b) In establishing a well spacing or drilling unit for a common source of supply thereunder, the acreage to be embraced within each unit and the shape thereof shall be determined by the Commission from the evidence introduced at the hearing, and the following facts, among other things, shall be material:

(1) The lands embraced in the actual or prospective common source of supply; (2) the plan of well spacing then being employed or contemplated in said source of supply; (3) the depth at which production from said common source of supply has been or is expected to be found; (4) the nature and character of the producing or prospective producing formation or formations; (5) any other available geological or scientific data pertaining to said actual or prospective source of supply which may be probative value to said Commission in determining the proper spacing and well drilling unit therefor, with due and relative allowance for the correlative rights and obligations of the producers and royalty owners interested therein.

The order establishing such spacing or drilling units shall set forth: (1) the outside boundaries of the surface area included in such order; (2) the size, form, and shape of the spacing or drilling units so established; (3) the drilling pattern for the area, which shall be uniform except as hereinbefore provided; and (4) the location of the permitted well on each such spacing or drilling unit. To such order shall be attached a plat upon which shall be indicated the foregoing information. Subject to other provisions of this act, the order establishing such spacing or drilling units shall direct that no more than one (1) well shall thereafter be produced from the common source of supply on any unit so established, and that the well permitted on that unit shall be drilled at the location thereon as prescribed by the Commission, with such exception as may be reasonably necessary where it is shown, upon application, notice and hearing in conformity with the procedural requirements of Sections 84 to 135, inclusive, Title 52, Oklahoma Statutes, and the Commission finds that any such spacing unit is located on the edge of a pool and adjacent to a producing unit, or for some other reason that to require the drilling of a well at the prescribed location on such spacing unit would be inequitable or unreasonable. Whenever such an exception is granted, the Commission shall adjust the allowable production for said spacing unit and take such other action as may be necessary to protect the rights of interested parties.

(c) The Commission shall have jurisdiction upon the filing of a proper application therefor, and upon notice given as provided in subsection (a) above, to decrease the size of the well spacing units or to permit additional wells to be drilled within the established units, upon proper proof at such

hearing that such modification or extension of the order establishing drilling or spacing units will prevent or assist in preventing the various types of wastes prohibited by statute, or any of said wastes, or will protect or assist in protecting the correlative rights of persons interested in said common source of supply, or to enlarge the area covered by the spacing order. If such proof discloses that the development or the trend of development indicates that such common source of supply underlies an area not covered by the spacing order. The Commission shall not establish well spacing units of more than forty (40) acres in size covering common sources of supply of oil the top of which lies less than 4,000 feet below the surface as determined by the original or discovery well in said common source of supply. The Commission shall not establish well spacing units of more than eighty (80) acres in size covering common sources of supply of oil the top of which lies less than 9,980 feet and more than 4,000 feet below the surface as determined by the original or discovery well in said common source of supply.

(d) The drilling of any well or wells into any common source of supply for the purpose of producing oil or gas therefrom, after a spacing order has been entered by the Commission covering such common source of supply, at a location other than that fixed by said order is hereby prohibited. The drilling of any well or wells into a common source of supply, covered by a pending spacing application, at a location other than that approved by a special order of the Commission authorizing the drilling of such well, is hereby prohibited. The operation of any well drilled in violation of any spacing so entered is also hereby prohibited. When two (2) or more separately owned tracts of land are embraced within an established spacing unit, or where there are undivided interests separately owned, or both such separately owned tracts and undivided interests embraced within such established spacing unit, the owners thereof may validly pool their interests and develop their lands as a unit. Where, however, such owners have not agreed to pool their interests and where one such separate owner has drilled or proposes to drill a well on said unit to the common source of supply, the Commission, to avoid the drilling of unnecessary wells, or to protect correlative rights, shall, upon a proper application therefor and a hearing thereon, require such owners to pool and develop their lands in the spacing unit as a unit. All orders requiring such pooling shall be made after notice and hearing, and shall be upon such terms and conditions as are just and reasonable and will afford to the owner of such tract in the unit the opportunity to recover or receive without unnecessary expense his just and fair share of the oil and gas. The portion of the production allocated to the owner of each tract or interests included in a well spacing unit formed by a pooling order shall, when produced, be considered as if produced by such owner from the separately owned tract or interest by a well drilled thereon. Such pooling order of the Commission shall make definite provisions for the payment of cost of the development and operation, which shall be limited to the actual expenditures required for such purpose not in excess of what are reasonable, including a reasonable charge for supervision. In the event of any dispute relative to such costs, the Commission shall determine the proper costs after due notice to interested parties and a hearing thereon. The operator of such unit, in addition to any other right provided by the pooling order or orders of the Commission, shall have a lien on the mineral leasehold estate or rights owned by the other owners therein and upon their shares of the production from such unit to the extent that costs incurred in the development and operation upon said unit are a charge against such interest by order of the Commission or by operation of law. Such liens shall be separable as to each separate owner within such unit, and shall remain liens until the owner or owners drilling or operating the well have been paid the amount due under the terms of the pooling order. The Commission is specifically authorized to provide that the owner or owners drilling, or paying for the drilling, or for the operation of a well for the benefit of

Note 3

all shall be entitled to production from such well which would be received by the owner, or owners, for whose benefit the well was drilled or operated, after payment of royalty, until the owner or owners drilling or operating the well have been paid the amount due under the terms of the pooling order or order settling such dispute. No part of the production or proceeds accruing to any owner of a separate interest in such unit shall be applied toward payment of any cost properly chargeable to any other interest in said unit.

For the purpose of this section the owner, or owners, of oil and gas rights in and under an unleased tract of land shall be regarded as a lessee to the extent of a seven-eighths (⅞) interest in and to said rights and a lessor to the extent of the remaining one-eighth (⅛) interest therein. Should the owners of separate tracts or interests embraced within a spacing unit fail to agree upon a pooling of their interests and the drilling of a well on the unit, and should it be established by final, unappealable judgment of a court of competent jurisdiction that the Commission is without authority to require pooling as provided for herein, then, subject to all other applicable provisions of this act, the owner of each tract or interest embraced within a spacing unit may drill on his separately owned tract, and the allowable production therefrom shall be that portion of the allowable for the full spacing unit as the area of such separately owned tract bears to the full spacing unit.

In the event a producing well, or wells, are completed upon a unit where there are, or may thereafter be, two (2) or more separately owned tracts, any royalty owner or group of royalty owners holding the royalty interest under a separately owned tract included in such spacing unit shall share in the one-eighth (⅛) of all production from the well or wells drilled within the unit, or in the gas well rental provided for in the lease covering such separately owned tract or interest in lieu of the customary fixed royalty, in the proportion that the acreage of their separately owned tract or interest bears to the entire acreage of the unit; provided, where a lease covering any such separately owned tract or interest included within a spacing unit stipulates a royalty in excess of one-eighth (⅛) of the production, or said lease shall be subject to an overriding royalty, to production payment or other obligation, then the lessee of said lease out of his share of the working interests from the well drilled on said unit, shall sustain and pay said excess royalty, overriding royalty, or production payment, and therefrom meet any other obligation due in respect to the separately owned tract or interest held by him.

Amended by Laws 1971, c. 246, § 1, emerg. eff. June 16, 1971.

Law Review Commentaries

Oil and gas:

Effect of mixed reservoir action on a prior forced pooling order. 28 Okl. L.Rev. 173 (1975).

Non-operating oil and gas interests' liability for post-production costs and expenses. Richard E. Altoon, Charles S. Lindberg. 25 Okl.L.Rev. 363 (1972).

State regulation of natural gas to prevent waste and protect correlative rights--what power remains today? 25 Okl.L.Rev. 427 (1972).

Use and proper drafting of shut-in royalty clauses. Professor Maurice H. Merrill, 43 Okl.B.J. 2247 (1972).

2. —— Police power

The power of the Corporation Commission to regulate the production of oil and gas is derived from the police power but is limited by the statutes authorizing such regulation. Helmerich & Payne, Inc. v. Corporation Commission, Okl., 532 P.2d 419 (1975).

3. —— Due process

Where neither order of the Corporation Commission providing for location of well within drilling unit on land whose owner did not consent to location of well on his property nor order pooling interests and adjudicating rights and equities of oil and gas owners in the drilling and spacing unit purported to award or deny any compensation to protesting owner for damage, such owner was not deprived of his property without due process by reason of fact that he was not afforded a jury trial. Texas Oil & Gas Corp. v. Rein, Okl., 534 P.2d 1277 (1975).

Permitting one producing well only on each spacing (drilling) unit without granting right to nondrilling oil and gas lessees and owners to participate in production of unit well as of time the nondrilling lessees and owners are prohibited from drilling would constitute taking by the state of their property without due process. Ward v. Corporation Commission, Okl., 501 P.2d 503 (1972).

Attachment 5

FOOD AND FUEL FOR THE FUTURE THROUGH GASOHOL

First quality grains are not needed for a grain alcohol plant. Sample grade grain and lower quality grains, including distressed, moldy and sprouting grains, can also be used. The by-product cattle feed (distillers dried grains plus solubles) produced is suitable for regular use since toxins which might be present in the grain are destroyed in the normal fermentation and purification stages. Thus, grain which would not normally be used can now enter into the human food chain as beef protein. But this is not the only way in which protein production is increased through the production of grain alcohol.

In the "Proceedings of the 10th Distillers Feed Conference" in 1955, Mr. W.P. Garrigus reports results of feeding trials using corn and distillers dried grains plus solubles. In these tests a ration of ground shelled corn and mixed grass hay was compared to a ration containing the same amount of grass hay and 80% as much corn with the balance of the ration being the distillers dried grains plus solubles (DDGS) resulting from fermentation of the other 20% of the corn. Results of the test showed that with the hay and corn rations 474 lbs. of beef were produced per 100 bushels of corn while the hay-corn-DDGS ration produced 535 lbs. of beef. This is a 12.9% increase in the amount of beef produced. DDGS can also replace soybean meal in cattle feed rations.

But an even greater potential exists for the production of protein from DDGS. Researchers at the University of Nebraska have extracted protein from DDGS in a form which can be used in human food, even when distressed grain is used as the starting material. This prospect could greatly increase the world's supply of protein and enhance the economics of ethyl alcohol manufacture. It is significant to note that when one makes ethyl alcohol from grain, recovers half of the protein from the distiller's by-products, and feeds the remaining residual grain to cattle, 50% more protein is available for human consumption than if the original whole grain had been fed directly to cattle. The incremental rate of return on the additional investment required to recover 24,000,000 lbs./yr. of an 85% protein concentrate from DDGS produced in a 20 million gallon per year grain alcohol plant is very attractive.

In Nebraska we have more than enough distressed grain each year to supply the feed for a 20 million gallon per year grain alcohol plant. Grades below sample grade could yield another 60-70 million gallons per year. Thus, we see that the Nebraska **Gasohol** program can add not only needed automotive fuel to the economy but can also increase protein production giving us "Food and Fuel for the Future."

If you need any further information on any aspect of this program, please contact:

Charles R. Fricke, Administrator
Agricultural Products Industrial
Utilization Committee
3rd Floor
301 Centennial Mall South
Lincoln, Nebraska 68509
Phone (402) 471-2941

A SUMMARY

GASOHOL

"Food and Fuel for the Future"

Sponsored By
AGRICULTURAL PRODUCTS
INDUSTRIAL UTILIZATION COMMITTEE
State of Nebraska

THE NEBRASKA GASOHOL PROGRAM

In an effort to provide a new domestic source of energy and to stimulate the agricultural economy of Nebraska the 82nd Nebraska Legislature (1971-72) passed bills which established a program to aid in the development of a grain alcohol industry in Nebraska through the introduction of an automotive fuel containing a blend of 10% agriculturally derived ethyl alcohol and 90% unleaded gasoline. This fuel was named **Gasohol.** In order to encourage the sale and use of **Gasohol,** the legislation provides a 3 cent per gallon reduction in the State gasoline tax on any such fuel sold. With this tax reduction the price of **Gasohol** is competitive with that of unleaded gasoline.

The Agricultural Products Industrial Utilization Committee (APIUC) was established to administer the **Gasohol** program. Membership of the APIUC consists of four people actively engaged in farming, two in business, and one representative of the petroleum industry. Its primary responsibilities are to analyze and develop the means to produce and market **Gasohol** in cooperation with private industry, and to sponsor research and development of industrial uses for by-products resulting from the manufacture of agricultural ethyl alcohol in order to enhance the economic attractiveness. Funds to carry out the above activities result from a 1/8 cent per gallon withholding from the gasoline tax refund which is otherwise returned to users of gasoline for off-highway purposes.

An initial survey of the technical literature for the APIUC indicated that a need existed for a comprehensive fleet test program to scientifically investigate and document the technical suitability of **Gasohol** under year around highway and city driving conditions. As a result, the APIUC provided a grant to Dr. Wm. A Scheller, Chairman of the Department of Chemical Engineering at the University of Nebraska, to direct and conduct in cooperation with the Nebraska Department of Roads a Two Million Mile **Gasohol** Road Test. This test program is currently underway, using a fleet of 45 vehicles belonging to the Nebraska Department of Roads. All results to date are encouraging. Consumption of **Gasohol** appears to be about 5% less than for unleaded gasoline. No unusual engine wear or carbon build-up has been found and the drivers report no problems of starting, vapor lock or drivability.

Additionally, the APIUC conducted a marketing experiment in which over 90,000 gallons of **Gasohol** were sold to the public for about 11 weeks at a Cooperative service station in Holdrege, Nebraska. This test has been completed, and analyses of the results indicate a most enthusiastic acceptance of **Gasohol** by the motoring public.

In order for **Gasohol** to become available to the people of Nebraska, it is necessary to build one or more grain alcohol plants in our state. Each plant capable of producing 20 million gallons per year of ethyl alcohol from grain will require a capital investment by private industry of about $21 million. The APIUC is exploring attractive means for financing the construction of an alcohol plant by private industry and is actively encouraging a decision to build in Nebraska.

GASOHOL

ECONOMICS OF GRAIN ALCOHOL PRODUCTION BY FERMENTATION

The process for making agricultural ethyl alcohol involves the action of enzymes and yeast on sugars or starch contained in grain, potatoes or other agricultural products. The ethyl alcohol is separated from the residual material with several distillation columns. Food quality grain is not required for making ethyl alcohol. Distressed (wet, moldy) grain works equally well and the Nebraska Department of Agriculture estimates that sufficient distressed grain exists in Nebraska annually to feed a plant that makes 20 million gallons of ethyl alcohol per year. Furthermore, when distressed grain is not available, the plant would use the cheapest source of starch, usually a feed grain such as milo producing a valuable cattle feed as a by-product.

Nebraska gasoline sales total about 900 million gallons per year. A grain alcohol plant capable of producing 20 million gallons per year of anhydrous ethanol would thus provide the alcohol needed to market up to 22% of the State's automotive fuel as **Gasohol.** This much grain alcohol can be produced from about 21,300 bushels per day of milo or corn. In addition to the alcohol, about 213 tons per day of a high protein cattle feed (distillers dried grains with solubles) and 174 tons per day of carbon dioxide gas would be produced as by-products. Such a plant would have an income of $29,150,000 per year while the expenses would be $22,000,000 providing a profit before taxes and depreciation is $7,150,000/yr.

The total capital investment (on-plot plus off-plot) for producing 20 million gallons per year of anhydrous ethanol is $21,000,000. Assuming that approximately 28% ($6,000,000) of total investment is provided by private capital and the balance of $15,000,000 is borrowed at 10% interest of 20 years, the net profit after depreciation, interest on the loan, corporation taxes and a reserve for loan repayment is $1,310,00/yr or 21.8% of the private capital of $6,000,000. The net cash flow is $3,410,00/yr.

Tangeman
Attachment 6.

My name is Vincent Tangeman, a farmer from Centralia, Kansas.

I was asked by the Mid-America Coalition for Energy Alternatives to give a presentation to this committee on Methanol, describing my experience and any further knowledge I have on future potential.

As for my own experience, I have an attachment on my car and pickup that injects alcohol or alcohol and water in small amounts during acceleration and high speeds. The alcohol increases the octane rating of the gas, and the timing can be advanced 8 to 10 degrees. The result is a cleaner engine, less pollution because all the gases are burned, and an increase in gas mileage. The average car should consume a gallon of alcohol every 250 to 400 miles. A heavy-footed driver will use considerably more than a light-footed driver. Our pickup uses considerably more than the car. Our gas mileage increased approximately 2 miles per gallon on the car and 5 miles per gallon on the pickup. The unit retails for $89.50 and I buy the Methanol here in Topeka for $1.00 a gallon in 55 gallon drums.

My knowledge for the future potential of Methanol is just what I gain from reading about it. I have read several articles by Leslie Grove who is a consulting engineer from St. Paul, Minnesota and has several patents in uses of fuel and fuel systems. He is known throughout the U.S. and Europe for various research and development projects. I hope to build my own unit, if I can find the time, or buy a unit complete to make my own Methanol.

I am concerned mostly with developing a project to save energy on my own farm. The current government farm policy guarantees the country a major economic depression, and we have to do everything possible to become self sufficient. On farm production of tractor fuel is one way to help a farmer get more nearly parity for his production of raw materials and labor. First we can produce what we need on the farm and then when the people as a whole wake up we can produce for them also.

The chemical formula for Methanol is CH_3OH. Most of the current production is by synthetic means. It stores easily but is a violent poison.

To burn Methanol alone in a car or truck requires a slight modification of the carburetor. Methanol as a motor fuel fulfills all the requirements of the EPA. At current prices it is not economical as it takes more gallons of Methanol to deliver the same power as gas. However, Leslie Groves estimates a farmer can produce his own for about 8 cents a gallon.

The raw material for Methanol production is renewable. A cord of wood will make about 50 gallons of fuel. Anything organic around the farm that will burn can be used. Planting trees along our major highways and harvesting every five years could possibly produce enough fuel to propel all the vehicles on the road.

Tractors were once made in the U.S. to run on Mathanol fuel. All the farm tractors and the riverboats in the Scandinavian countries are running on gasification units. Germany, during World War II relied heavily on Methanol. My brother saw a truck over there stop along the road, cut a little wood and put it in a unit on top of the cab and drive on. He was manufacturing his own fuel as he drove down the road. Most of the young countries produce their own Methane and Methanol.

I wish to thank the committee for giving me this opportunity to express my views on Methanol.

Attachment 1

MEMORANDUM

August 16, 1977

TO: Special Committee on Energy

FROM: Kansas Legislative Research Department

RE: "Gasohol" and its Potential for Development in Kansas

Background

Energy and agriculture are two of the nation's most important industries and areas for policy development to meet the problems facing both today and tomorrow. The costs of all fossil fuels have doubled, tripled, and even quadrupled during the past three years. Energy costs are now a significant factor in the financially stressed agricultural sector of our economy. The agricultural industry is also a large consumer of energy; annual energy consumption estimates are follows:

3.7 billion gallons of gasoline
2.6 billion gallons of diesel fuel
164 billion cubic feet of natural gas
1.5 billion gallons of LPG
32 billion kilowatt hours of electricity

As in other areas of the economy, agriculture is attempting to find ways of cutting back its consumption of energy without endangering its position of being the largest employer and consumer of hard goods in the nation. Some 14 to 17 million people are involved in some phase of the food production, with more than 4.4 million people engaged in the actual farming process.

The problems facing the agricultural sector of our economy are also tremendous. A seemingly annual surplus of cereal grains, depressed prices, tight credit, high land prices, and overall increasing costs in the production of food have made the economic outlook for farmers rather bleak. A critical problem has been finding additional markets for the surplus of farm products. One possible market for surplus cereal grains offers a potentially partial solution to the energy problem and agricultural market problem mentioned above — the production of grain alcohol from cereal grains.

Introduction

Interest in the use of alcohol as an automotive fuel additive is as old as the internal combustion engine itself. In 1907 and again in 1938, the United States Department of Agriculture published booklets on producing motor fuel from agricultural products and the possible use of those fuels in farm engines.

Prior to 1945 most of the alcohol consumed in the United States was produced by fermentation of grains or molasses. Since then a synthetic alcohol produced from enthylene, a petroleum derivative, has dominated the alcohol market. Consequently, the conversion of cereal grains through fermentation into ethyl alcohol (ethanol) is an old process, and even today government regulations require that alcohol for human consumption be produced by fermentation.

A recent study provides a description of the process whereby ethanol is produced:

> The production of alcohol by fermentation is dependent upon the unique ability of yeasts to convert sugars to alcohol and carbon dioxide. When starchy materials are to be used, the starch is first converted to sugars (glucose, maltose) by the action of barley malt of similar substances. Yeast then utilizes the sugar for alcohol production in the fermentation process. The products of the overall fermentation process, including distillation, are alcohol, "dried distillers grains and solubles", and carbon dioxide. When cereal grains are fermented the three products are obtained in approximately equal amounts by weight.

Gasohol is a registered trademark for a fuel mixture of 10 percent anhydrous ethanol and 90 percent unleaded gasoline.

Since World War II interest in the production of ethanol from agricultural products has fluctuated in relation to the price of grains. Whenever grain prices have fallen to extremely low levels, interest in gasohol has been renewed. Prior to the Arab oil embargo, gasohol could not be economically produced to compete with the prevailing price of gasoline.

Since 1973, the price of imported crude oil has quadrupled. This factor alone has placed ethnol derived from grain on a competitive basis with synthetic alcohol (extracted from ethylene) in the industrial market place and it may become an economic additive to unleaded automotive fuel with an increase in gasoline prices. In addition to the increased cost of oil, several other factors can be cited to support the serious consideration of developing gasohol as an alternative fuel source. These factors are: the historically low prices paid for cereal grains, the perennial grain surplus situation, the availability of lower quality grain which can be used in making alcohol, the beneficial by-products derived from the ethanol process using lower quality grains, and the positive contribution gasohol makes towards energy conservation.

Experts in economics and energy policy and other professionals argue that the price of fossil fuels will continue to rise indefinitely. The higher the price of gasoline, the more competitive gasohol will be. In contrast to the increase in gasoline prices, the price of grain has continued to decline from the abnormally higher prices of 1973 and 1974. In fact, from 1950 to 1976, the average price of wheat, corn, and sorghum per bushel in Kansas has been $1.99, $1.44, and $1.15 respectively. In spite of these low prices, the cost of producing these three grain crops has increased over the same period. Already, wheat prices have decreased 42 percent from June 1976 to June 1977, and corn prices have dropped one-fourth since a year ago. For 1976, it has been estimated that it cost between $2.88 to $3.31 to produce a bushel of wheat in Kansas (the figures depend on the type of production).

In a survey of farmers within a 100-mile radius of an ethanol alcohol plant near Muscatine, Iowa, the average price per bushel of grain sold was ten cents higher than the statewide average.

Grain surpluses have always been a major factor in determining the price paid for crops grown in the United States. Year in and year out, Kansas farmers have demonstrated their ability to successfully grow high yield crops. However, in their earnest desire to produce, large surpluses have resulted which have kept prices down. This year in particular appears to be a surplus year. The USDA announced on June 24, 1977, that the wheat surplus for the 1977 crop would be the greatest since 1963. As of June 1, 1977, the wheat surplus was set at 1.1 billion bushels. The report also showed more than 235 bushels of corn were in storage on June 1, up 26 percent from the same time last year.

With such abundant surpluses, some of the excess grain could be used in producing ethanol for a gasohol fuel blend which would provide the farmers with another market for their product. In addition, to alleviate the possible fears by some people regarding the use of edible food grain for fuel, it should be pointed out that sample grade or distressed grade grain which cannot be used for human consumption can be used to make ethanol. During normal years of production, it is estimated that between 1 and 5 percent of the total grain crop in Kansas falls into the category of sample grade or lower. However, because the Crop Reporting Service does not keep records on distressed grains, the availability of them on a continuous basis may be questionable.

In Nebraska, it has been estimated that 1 percent of the total grain crop could be used to supply one grain alcohol plant with enough grain to produce 20 million gallons of alcohol. This would make 200 million gallons of gasohol, or 20 percent of the state's consumption. Using the same projections for Kansas, it would take approximately six or seven grain alcohol plants producing 20 million gallons of ethanol to make enough gasahol to have provided the state's 1976 gasoline consumption of 1,253,180,273 gallons at a 1 to 9 mixture ratio. Five of the projected ethanol plants would require less than the 5 percent of sample grade or distressed grain that appears to be available annually from the total grain crop harvested in Kansas.

Besides providing a new non-depleting domestic source of energy and providing a stimulus for the agricultural economy of the state, the process used to make alcohol from grain produces two significant by-products that are profitably marketable — high-protein cattle feed and a protein derivative for human consumption. When using sample grade grain or lower quality grains in the alcohol extraction process, the by-product cattle feed (distillers dried grains plus solubles) produced is suitable for regular use since toxins which might be present in the grain are destroyed in the normal fermentation and purification process. Thus, grain which would not normally be used can now enter into the human food chain as beef protein. Researchers at the University of Nebraska have extracted protein from distillers dried grains plus solubles (DDGS) in a form which can be used in human food regardless of the original grain quality (the exact cost to extract this protein is not currently known.) As a result of this research, it has been found that 50 percent more protein is available for human consumption as a result of the process used to make grain alcohol than if the original whole grain had been fed directly to cattle.

Federal legislation which has been enacted proposes to significantly improve fuel efficiency of automobiles sold in the United States. President Carter's national energy plan calls for a reduction of gasoline consumption of 10 percent by 1985. In line with both of the above policy goals, the development and use of a fuel additive that

reduces the consumption of gasoline appears to be an appealing alternative for accomplishing both policies. In a two-million-mile gasohol road test that is being conducted by Dr. William H. Scheller of the University of Nebraska for the Agricultural Products Industrial Utilization Committee (APIUC), the results after the first one million miles reveal that consumption of gasohol appears to be about 5 percent less than for unleaded gasoline. The test is being conducted with 45 vehicles supplied by the Nebraska Department of Roads. To date, there have been no findings of unusual engine wear or carbon build-up in any of the vehicles tested.

In addition to an increase of fuel efficiency using gasohol, the APIUC recently had a study conducted at the Energy Research and Development Administration (ERDA) testing facilities at Bartlesville, Oklahoma, on the differences in exhaust pollution between two cars, one using gasohol and the other using unleaded fuel. The ERDA test results should be available in late August of 1977.

In 1971 and 1972 the Nebraska Legislature passed various bills which established the gasohol program in the state and created the Agricultural Products Industrial Utilization Committee (APIUC) to administer the program. The program is funded by collection of one-eighth of one percent of the refundable tax on motor vehicle fuel used by vehicles for off-highway purposes. Money collected from that tax, $90,000 annually, is deposited in the Agricultural Alcohol Fuel Tax Fund and is used for the following purposes:

1. Establishment, with cooperation of private industry, of procedures and processes necessary to the manufacture and marketing of agricultural ethyl alcohol-blended fuels;

2. Establishment of a procedure for entering such blended fuel into the marketplace by private enterprise;

3. Analysis of the marketing process and testing of marketing procedures to assure acceptance in the private marketplace of such blended fuels and by-products resulting from its manufacture;

4. Cooperation with private industry to establish privately-owned agricultural ethyl alcohol manufacturing plants in Nebraska to supply demand for such product; and

5. Sponsoring research and development of industrial uses for by-products resulting from the manufacture of agricultural ethyl alcohol in order to enhance economic feasibility.

At the beginning of the 1977 Nebraska Legislative Session, Legislative Bill No. 52 was introduced which proposed a two cent per bushel excise tax on wheat, corn, and milo grown in Nebraska and sold or stored anywhere. The excise tax would be collected for use by the Agricultural Products Industrial Utilization Committee for land acquisition, construction, and initial operating expenses of a grain alcohol manufacturing plant. Growers who consented to the tax would have the right to approve the Committee's plans.

L.B. 52 also would have revised the present motor fuel tax statutes to assist gasohol motor fuel in becoming competitive with present motor fuels by assessing a motor fuel tax that is five cents a gallon less than all other motor fuels.

In May of 1977, the Governor of Nebraska signed into law the amended ersion of L.B. 52. Deleted from the original bill were the provisions for the 2 cent per oushel excise tax and the construction of a grain alcohol plant by the state. The reduced motor fuel tax was kept as the major incentive to encourage the use of gasohol. Although the fuel tax on gasohol is now 4½ cents, it is still 5 cents lower than the fuel tax on all other motor fuels of 9½ cents.

The provisions for the excise tax and construction of a state-owned grain alcohol plant were deleted because of two reasons: (1) a group of private entrepreneurs came forward with their plans to construct a grain alcohol in Nebraska through the private sector; and (2) pending federal legislation could provide the financial assistance necessary to construct a grain alcohol plant, thus relieving the state of this burden.

Federal Legislation

Two bills (H.R. 7171 and S 1461) were introduced in May of 1977 by members of the Nebraska congressional delegation to provide government-guaranteed loans of up to $15 million per project for four pilot projects designed to convert farm products into industrial hydrocarbons. The Secretary of Agriculture would be authorized to approve four projects by public, private, or cooperative organizations organized for profit or nonprofit, or by individuals for a term not to exceed 20 years. In addition, both bills also direct the Secretary of Agriculture to make research grants available to all eligible institutions of up to $3 million per state for the purpose of conducting research related to: (1) the production and marketing of coal tar for the manufacture of agricultural chemicals and alcohol-blended motor fuel, (2) the production and marketing of alcohol made from agricultural commodities and forest products as a substitute for alcohol made from petroleum products, and (3) the production and marketing of other industrial hydrocarbons derived from agricultural commodities and forest products.

Both bills were favorably voted out of their respective agricultural committees and have been included in each house's version of the 1977 farm bill. It has been reported that both bills have significant support from both urban and rural legislators. There appears to be no move to have these programs deleted from the final farm bill, although the outcome of either bill is dependent to a large degree on what level of price support the Congress and the President agree upon.

State Legislation

Three other states have recently passed legislation relating to gasohol, as follows:

Montana. The 1977 Montana Legislature passed Senate Joint Resolution 43 this year calling for research into the economic feasibility of gasohol. In addition, Montana is also trying to encourage public interest in the grain alcohol program through educational programs and through the use of bumper stickers.

Minnesota. The Minnesota Legislature passed as part of its "Omnibus Energy Bill" a grant of $50,000 to the University of Minnesota to conduct a demonstration project using agriculturally derived ethyl alcohol and diesel fuel.

Wisconsin. The Wisconsin Legislature passed a bill to lower the liquor tax on alcohol made from whey and brewey wastes. The idea is to encourage making a fuel from the process.

Feasibility of Gasohol

The question concerning the feasibility of gasohol given the price of various commodities, cost to build a grain-alcohol plant, prices paid for grain alcohol and the feed by-products, costs to develop a marketing system, inflation, etc., is one which an answer is hard to determine because of the large number of fluctuating variables. Discussions with various people from Nebraska, Midwest Solvents, Farmland Industries, and FAR-MAR-W have yielded different answers as to the question of the over-all feasibility of producing gasohol. Each of the above-mentioned groups has indicated that there is a possibility for economically producing grain alcohol to sell in the industrial marketplace,with some of the production being potentially developed into gasohol.

The following two tables provide information on the effects of a commodity's price on the production of grain alcohol. Table I views the effect of milo price on the net cash flow of a grain alcohol plant. This table was developed by Dr. William A. Scheller, Chairman of the Chemical Engineering Department, University of Nebraska.

Table II was developed by the staff with the aid of Keith Kilander from Midwest Solvents in Atchison, Kansas. This table indicates that given the various variables listed, the price of wheat cannot exceed $2.60 a bushel in order for the plant to break even at the current retail level of $1.15 a wine gallon for ethyl alcohol. Each of the factors listed in the table that affect this computation are explained in detail in the table's footnotes.

TABLE I

EFFECTS OF MILO PRICE/CWT ON NET CASH FLOW

Milo Price $/CWT	Net Cash Flow[1] % of Investment
$ 2.00	36.8
3.00	27.2
4.00	18.2
5.00	9.6
5.16	8.3*
5.68	0.0

* Net cash flow = depreciation.

1) Calculations are based on a 20 million gallon per year anhydrous grain alcohol plant. The net cash flow is defined as the amount of money remaining after all taxes are paid and it is equal to the net profit plus the depreciation. The investment used in calculating the percentage figure includes the investment in the plant plus the required working capital. The by-product distillers grains were priced at $120 per ton and the ethyl alcohol at $1.10 per gallon. Figures supplied by Dr. William A. Scheller, Chairman of the Chemical Engineering Department, University of Nebraska.

TABLE II

EFFECT OF WHEAT PRICE/BU ON THE PRODUCTION COST OF ETHYL ALCOHOL

A. Wheat Price/Bu.	B. Grain Cost Per Gal[1]	C. Conversion Costs[2]	D. By-Product Credit/Bu[3]	E. Total Cost for Producing 1 Wine Gal. of Alcohol .200 Proof	F. Profit or Loss at Current $1.15 Retail[4]
$ 1.75	$ .70	$ 32.8	$ 23.6	$ .792	$ .358
2.00	.80	.328	.236	.892	.258
2.25	.90	.328	.236	.992	.158
2.50	1.00	.328	.236	1.092	.058
2.55	1.02	.328	.236	1.112	.038
2.60	1.04	.328	.236	1.132	.018
2.65	1.06	.328	.236	1.152	- .002
2.70	1.08	.328	.236	1.172	- .022
2.75	1.10	.328	.236	1.192	- .042
3.00	1.20	.328	.236	1.293	- .112
3.25	1.30	.328	.236	1.392	- .242
3.50	1.40	.328	.236	1.492	- .342
3.75	1.50	.328	.236	1.592	- .442
4.00	1.60	.328	.236	1.692	- .542

1. The grain cost per gallon is obtained by dividing the wheat price per bushel by 2.5 which represents the estimated average gallons that can be derived from one bushel of wheat. The 2.5 gallons per bushel may be conservative. A report titled, "Production and Use of Grain Alcohol as a Motor Fuel: An Evaluation" published by the North Dakota State University Agricultural Experiment Station in October 1975, found that hard red spring wheat yielded 2.6 gallons per bushel of 200 proof ethyl alcohol. In addition, Dwight L. Miller of the USDA's Northern Regional Research Laboratory states that "a bushel of wheat, sorghum, or corn will yield, through fermentation, 2.6 to 2.7 gallons of ethyl alcohol."

2. The conversion costs used in this table were provided by Keith Kilander of Midwest Solvents in Atchison, Kansas, for the month of June. Included in the conversion costs are salaries, wages, energy inputs, and general administration.

3. The by-product credit figure was also supplied by Keith Kilander based upon the month of June figures for by-product sales on distiller dried grains plus solubles and CO^2.

4. The current price for a wine gallon of ethyl alcohol is $1.15. This price has prevailed for over six months. It has been estimated that at current types of usage for ethyl alcohol, the market would most likely grow from 2 to 3 percent annually after 1977 and increase in cost relative to increases in the general price levels of other commodities.

Problems Related to the Potential Development of Gasohol in Kansas

Several areas of the gasohol program contain potential problems that could negate the positive aspects of the program already discussed. In the process of obtaining the information on the concept of gasohol, much of it was of a technical nature and the problems relating to it need to be covered by the gasohol conferees scheduled for the August 23 Committee meeting. The problems with the gasohol concept are listed below:

1. If a gasohol plant were designed specifically to utilize distressed grain, the practical collection of distressed grain is questionable. The collection problem would occur primarily because the estimated amount of distressed grain annually available in the state is assumed to be located across the entire state and probably in small quantities. This problem poses a question concerning the economic feasibility of collecting and transporting distressed grain to the grain alcohol plant. In addition, the constant availability of distressed grain for the plant's day-to-day operation is also questionable.

2. In terms of grain alcohol production, there are two potentially major problems that question the validity of the gasohol concept. The first problem concerns available capital to build the plant. Although the federal government has proposed legislation to provide $15 million dollars in guaranteed loans for a grain alcohol plant, estimates are that a 20 million gallon a year plant would require a total capital investment of $21,000,000. The federal program may provide some of this capital, but the remaining amount of required capital will have to come from the private sector. Overall, the capital requirements for a 20 million gallon a year grain alcohol plant are large.

   The second problem concerns the actual energy offsets to produce grain alcohol. Considerable discussion is taking place within the scientific community over the energy contents of the grain alcohol and byproducts as opposed to the energy required to convert the grain to those products. Cloud Cray, Jr., of Midwest Solvents, recently commented that it takes 1.5 gallons of fossil fuels to produce one gallon of grain alcohol. This figure includes their credits for the energy content of the byproducts. Other research has found that the final products will be only two-thirds of the energy input by the farmer and the distiller. Others, however, do disagree. Dr. Scheller of the University of Nebraska has developed an equation which shows there is a net gain of energy content through the process of producing grain alcohol plus the various byproducts.

3. The marketing and distribution of gasohol appears to be of a limited nature and in a small region. Because no major oil companies have indicated an interest in marketing gasohol, the distribution of the product will be limited to a small area, even if a large cooperative were to market the product. A small marketing and distribution area would mean that a small number of the population would be able to obtain this less expensive motor fuel.

Attachment 8.

WIND ENERGY LABORATORY

WICHITA STATE UNIVERSITY

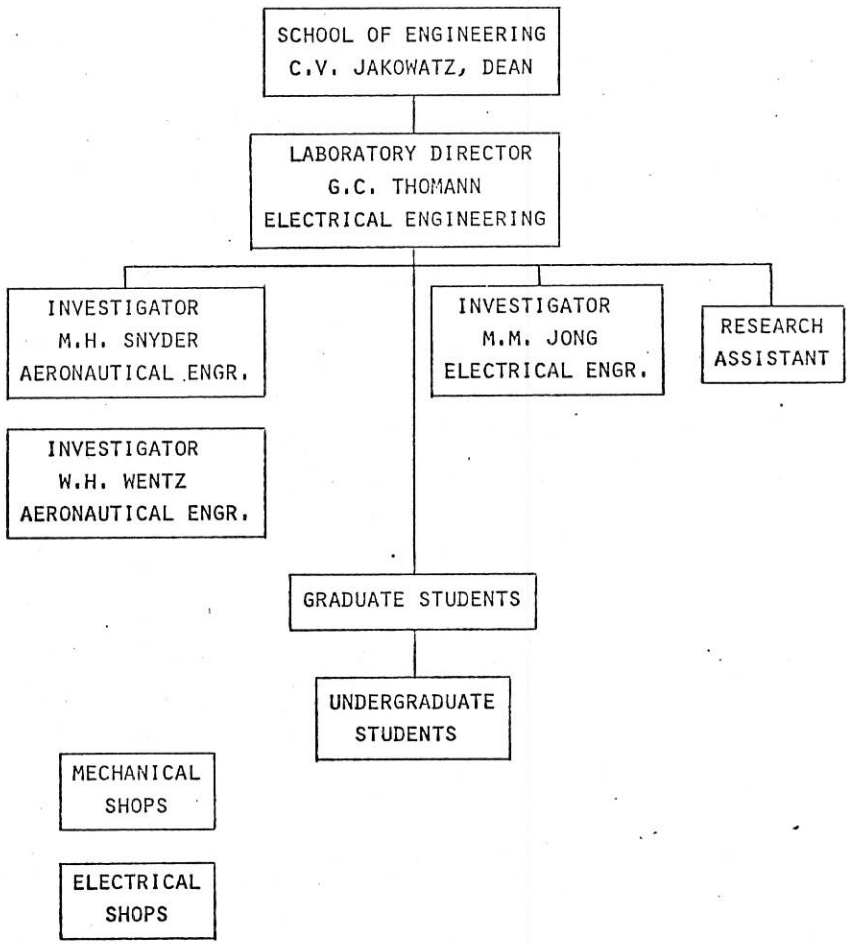
COMPOSED OF INVESTIGATORS FROM DEPARTMENTS OF ELECTRICAL AND AERONAUTICAL ENGINEERING

INVESTIGATING LARGE AND SMALL WIND TURBINES FOR THE GENERATION OF ELECTRICITY

COMPILING WIND STATISTICS FOR WESTERN HALF OF KANSAS AND DETERMINING OPTIMUM SITES WITHIN KANSAS FOR LOCATION OF WIND GENERATORS

WIND ENERGY LABORATORY

WICHITA STATE UNIVERSITY



WIND ENERGY LABORATORY
FY 1978 BUDGET
UNIVERSITY FUNDS

PERSONNEL

Investigators:

G. C. Thomann	9 mo @ 50% 1 mo summer (1977) 1 mo summer (1978)---------	12,845
M. M. Jong	9 mo @ 20% .5 mo summer (1978)--------	4807
M. H. Snyder	9 mo @ 15% 1 mo summer (1978)---------	6580
K. W. Rowe	12 mo @ 100%----------	11,500
Secretarial ----------		2625
Total ----------		38,357 (1)
Shrinkage, (1)/.97 - (1) ----------		1186
Fringe Benefits, .14 x (1) ----------		5370
Graduate Student Salaries ----------		10,000
Undergraduate Student Salaries ----------		560
TOTAL PERSONNEL ----------		55,473

NON-PERSONNEL

Materials ----------	2000
WSU Shop ----------	1000
Reproduction & Telephone ----------	500
Computer ----------	500
Travel ----------	1000
TOTAL NON-PERSONNEL ----------	5000
TOTAL ----------	$60,473

REPORTS

1. A Prototype Wind Generator System Supplying Energy to the Electric Utility Grid. August, 1975.

2. WER-1, Two-Dimensional Tests of GA(W)-1 and GA(W)-2 Airfoils at Angles-of-Attack from 0 to 360 Degrees. January, 1977.

3. WER-2, Wichita, Kansas Wind Characteristics Estimated from 1968 - 1973 NWS Data; Performance of the NASA 100 kW Prototype Wind Generator in the Wichita Wind Regime. February, 1977.

4. WER-3, Wind Characteristics for the Western Half of Kansas. September, 1977.

5. WER-4, The WSU 2 kW Horizontal Axis Wind Generator. September, 1977.

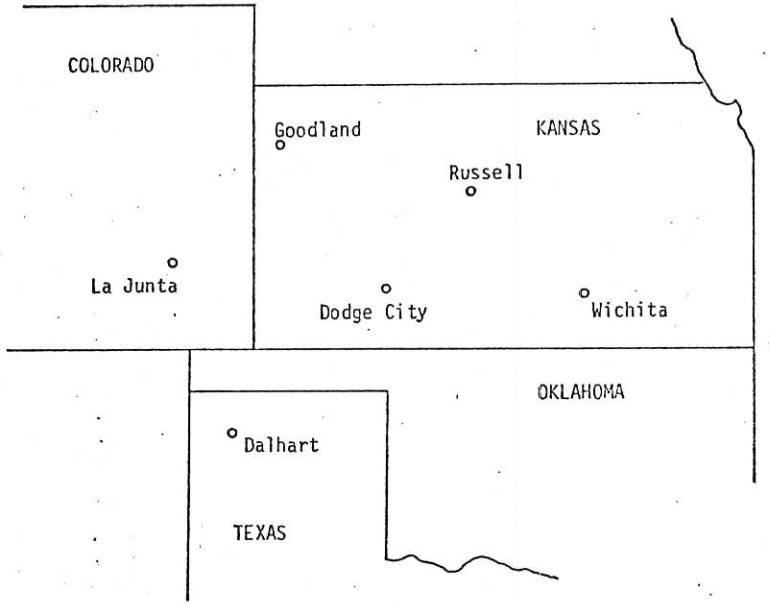
WIND CHARACTERISTICS AND SITE SELECTION

DETERMINE WIND CHARACTERISTICS OF THE WESTERN HALF OF KANSAS USING EXISTING NWS DATA

EVALUATION OPERATION OF LARGE SCALE WIND GENERATORS IN THE KANSAS WIND REGIME

DETERMINE SUITABILITY OF KANSAS FOR INSTALLATION OF GENERATING "FARMS"

EXPERIMENTALLY SELECT SITES AND MONITOR WIND CONDITIONS AT THESE SITES



CITIES FOR WHICH NWS DATA WAS OBTAINED TO CALCULATE WIND CHARACTERISTICS FOR WESTERN KANSAS

Table X. The overall mean wind speed and power density and standard deviations about these means for each station.

	Wichita	Russell	Dodge City	Goodland	Dalhart	La Junta
Average Speed, m/s	5.53	5.73	5.99	5.61	6.66	4.00
σ (speed), m/s	.29	.465	.33	.439	.515	.403
Power Density, W/m^2	178	193	200	187	337	94.3
σ (Power), W/m^2	22.0	33.2	27.8	46.5	68.7	32.3
K_e	1.79	1.78	1.68	1.91	2.08	2.71

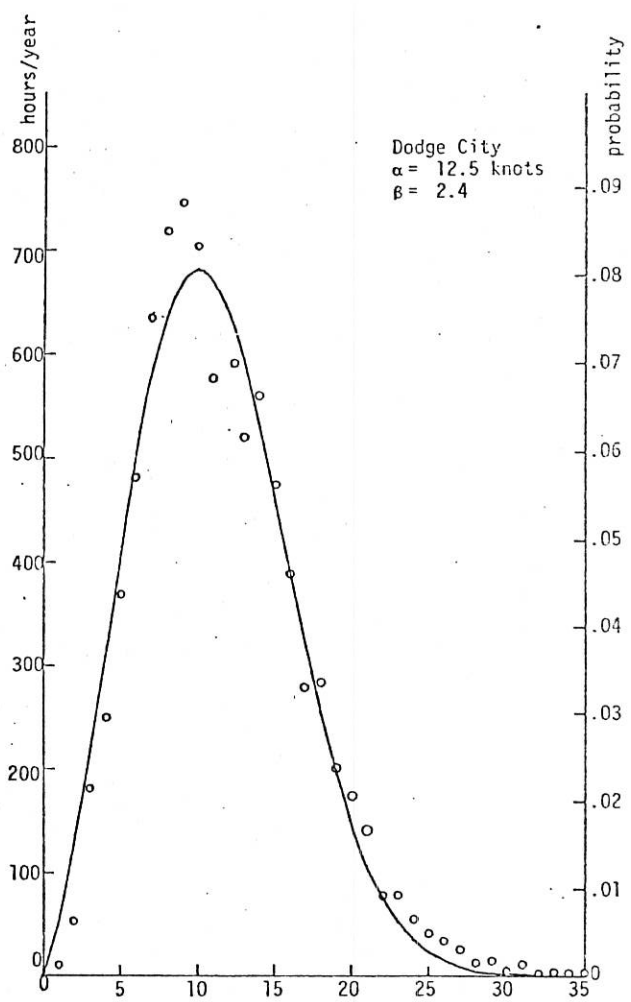
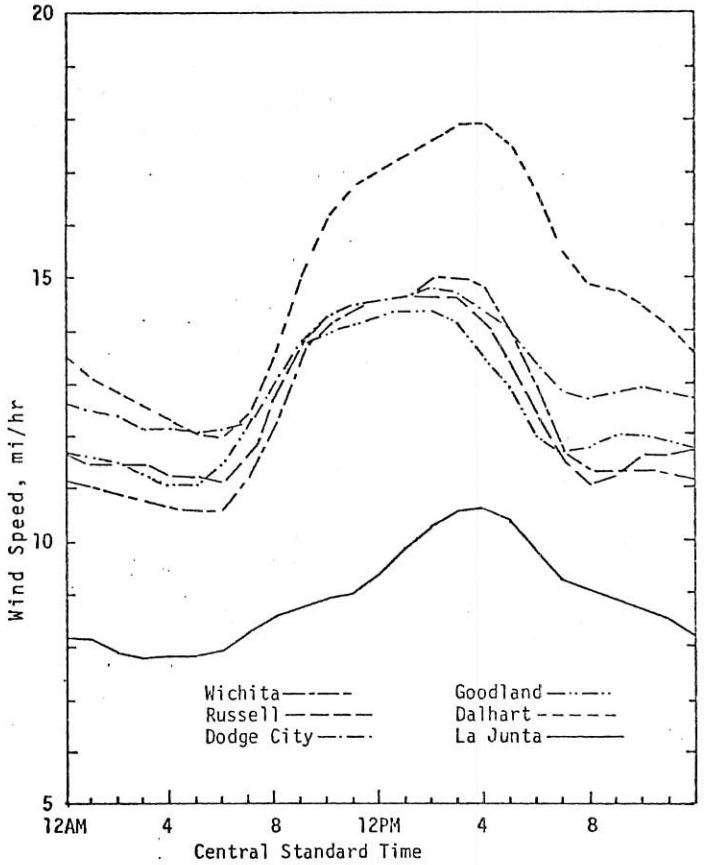


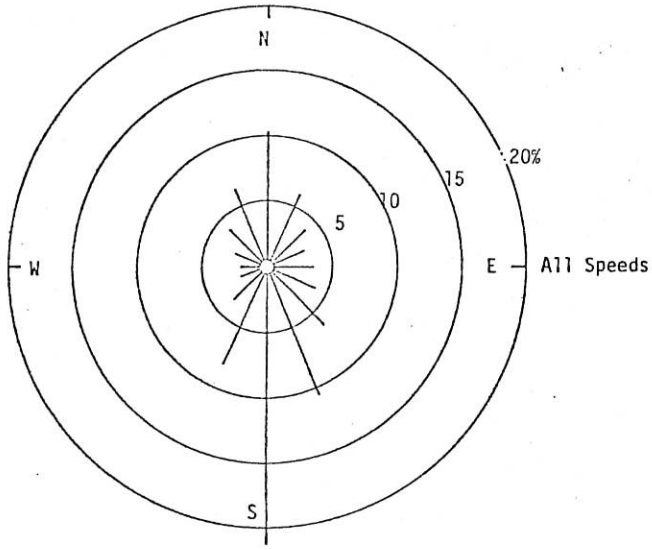
Figure 4. Velocity frequency data for Dodge City showing wind speed and the hours or the probability the wind is in a one knot range centered on that wind speed value. The curve is given by Eq. 6 and adjusted for a least squares fit to the data.

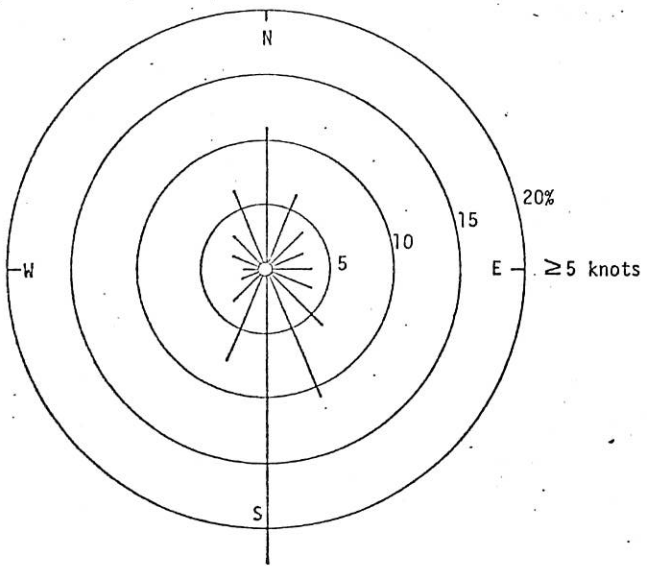
Table XIII. Monthly Average Wind Speed, Average Power Density, and Energy Pattern Factor for Dodge City, Kansas, for the Years 1948-1975.

Month	Speed			Power Density		Energy Pattern Factor, K_e
	m/s	mi/hr	knots	W/ft^2	W/m^2	
Jan	5.79	12.96	11.26	17.98	193.5	1.769
Feb	5.99	13.40	11.64	19.10	205.6	1.701
Mar	6.66	14.89	12.94	27.33	294.2	1.772
Apr	6.72	15.03	13.06	26.59	286.2	1.677
May	6.26	13.99	12.16	21.04	226.5	1.643
June	6.12	13.69	11.90	19.68	211.8	1.640
July	5.50	12.31	10.70	14.01	150.8	1.606
Aug	5.36	11.99	10.42	12.48	143.3	1.549
Sept	5.79	12.96	11.26	16.46	177.2	1.619
Oct	5.79	12.96	11.26	16.60	178.7	1.633
Nov	5.84	13.07	11.36	18.43	198.4	1.766
Dec	5.76	12.89	11.20	16.95	182.4	1.694
Mean	5.97	13.35	11.60	18.89	203.3	1.672
Stand. Dev.	0.414	0.925	0.803	4.438	47.77	0.071
Stand.Dev. /Mean	0.0692			0.2349		0.0425



DAILY VARIATION OF WIND SPEED FOR THE SIX STATIONS





WIND DIRECTION DISTRIBUTIONS FOR WICHITA

3KW HORIZONTAL AXIS WIND TURBINE

18 FT. GA(W)-1 AIRFOIL VARIABLE PITCH ROTOR

GEARBOX AND CHAIN-DRIVE SPEED UP SYSTEM

INDUCTION GENERATOR

3-PHASE POWER FED DIRECTLY INTO UTILITY GRID

WIND TURBINE PROGRAM GOALS

EVALUATE GA(W)-1 AIRFOIL FOR USE AS A WIND TURBINE ROTOR

EVALUATE THE INDUCTION GENERATOR FOR FEEDING POWER INTO THE UTILITY GRID

GAIN EXPERIENCE IN THE DESIGN, CONSTRUCTION AND TESTING OF WIND GENERATORS

EVALUATE THE OPERATION OF A WIND GENERATOR IN THE KANSAS WIND REGIME

FUTURE WORK

CONTINUE EVALUATION OF WSU 3 KW WIND TURBINE

EVALUATE THE OPERATION OF LARGE SCALE WIND GENERATORS IN KANSAS

MAKE A COMPLETE ANALYSIS OF WIND POWER APPLICATIONS FOR THE STATE OF KNASAS

FORM AN ADVISORY GROUP ON WIND POWER TO ASSIST KANSAS STATE GOVERNMENT

Kansas Municipal Utilities, Inc.

September 16, 1977

Representative Donald Mainey
430 Sumner
Topeka, Kansas 66616

Re: Proposal No. 20 - Rate Making Principles and Rate Structures

Dear Don:

I will be unable to attend the Sepcial Committee on Energy's scheduled meetings for September 21 and 22 because of a previous conflict.

However, I would like to make a few comments concerning Proposal No. 20 and have attached sufficient copies of this letter for all members of the committee.

The area of rates is very complex and I will not attempt to address all the facets, but I would like to make a few comments.

KMU basically supports a study by the Kansas Corporation Commission of rate structures with the purpose of formulating rate guidelines; but we would oppose establishment of mandatory standards. Such guidelines, if they were to be established, should support cost-based rates, as well as other rate proposals which are consistent with cost-based rates.

KMU believes, however, that it would be inadvisable to impose mandatory rate standards due to the enormous variations of electric systems in terms of load characteristics of customers and mix of available energy resources.

Concepts such as time of use pricing, lifeline, penalty pricing, flat rates, or inverted rate structures may be appropriate and efficient in certain systems, but entirely inappropriate in others. Thus, KMU recommends permitting local, state and federal regulatory bodies to review the characteristics of individual systems in light of any forthcoming guidelines.

KMU also firmly believes that all municipally-owned utilities should be exempt from any guidelines established by the KCC. Unless this is done, one of the major contributions of local public ownership -- the right of local utility consumers to control the policies of their own local utilities -- would be seriously undermined. The desirability of permitting municipally-owned utilities to chart their own course with respect to rates is evident from the fact that only 11 states assert any regulatory authority over the retail rates of non-profit municipally-owned electric systems.

P.O. Box 1225 McPherson, Kansas 67460 316-241-1423

POWER WATER GAS

For the Protection and Improvement of Municipal Utilities In Kansas

Atch. 4

Although KMU favors an active state regulatory role in helping formulate ideas in rate structures, we believe that the genius of innovative approaches may lie in the contribution of local planning and local initiatives.

Users and owners of municipal systems are one and the same, and this fact is a benefit that inures to the public beyond the service area of these utilities by providing a measure of competition by comparison to the regulated sector of the electric industry. Municipal power supplies a separate and useful input to state and federal regulatory agencies which seek to set standards of "just and reasonable" rates during this period of rapidly changing perceptions of future availability and cost.

KMU believes that municipal systems should have the option of continuing to encourage each of the voter users of these systems to retain a major share in the decision-making that affects rate policies. Citizens in our communities can initiate and implement plans for rate structures which meet their own community needs, and these may provide innovative and diversified examples for others to follow in dealing with rates and energy conservation. The governing boards of municipal utilities face the daily burden of accountability to their customers for all aspects of service. The result is an opportuinity for local innovation reflecting the concerns and interests of the community.

KMU is sympathetic with the problem facing low-income consumers who are being confronted with steadily rising energy costs, and we believe the Federal Government should provide some assistance to those in the society least able to absorb the added costs of energy. Cost-based pricing may assign cost to customers in an economically efficient manner, but it does not necessarily reduce the burden on members of society who are unable to pay for the level of service they require.

Studies, however, have consistently shown that electric use is not an accurate method of identifying low-income consumers. This matter cannot be solved by lifeline rates since the energy requirements of the poor are not necessarily smaller than those of the affluent.

The problems of a lifeline rate were indicated recently in a study by the Tennessee Valley Authority of a hypothetical lifeline rate which was applied to actual electricity consumption by families in high-income and low-income neighborhoods. Rates were reduced at lower levels of use and increased at higher levels to maintain the same overall revenues.

In this sample, the lifeline rate on the average produced higher electric bills for 26% of the low-income families (those already facing the highest bills under conventional rates) and at the same time reduced electric bills for 49% of high-income families.

In other words, TVA pointed out, this lifeline rate would have resulted in 26% of the low-income families helping to subsidize 49% of the high-income families. Use of lifeline rates adds distortion to the effort to achieve cost-based rate structures. Those unable to meet increasing prices of energy may require income transfers, but this is properly a responsibility of government, rather than utility systems.

Assistance to low-income consumers in providing better insulation would be one effective means of assisting such consumers, while at the same time accomplishing a goal of conservation.

KMU strongly believes in declining block rates where such decreases in cost per kilowatt hour reflect the decrease in such cost of providing electric service to such consumer or class as such consumption increases during any such period. Unless this concept is maintained, there may be serious departures from cost-based rates where total costs per kilowatt hour decline with additional deliveries of kilowatt hours to consumers.

KMU also would oppose establishment of any policy for retail adjustment clauses other than those used to cover costs of fuel (fuel adjustment clauses). Establishment of clauses other than for fuel costs could become a subsidy for inefficiency by permitting the costs of such inefficiency to be passed on to the consumer without regulatory interference. Justification can be made for fuel adjustment clauses due to current uncertainties and large fluctuations in the cost of fuel; but other operating expenses such as expenses for wages, overhead, local taxes, insurance, etc., can be predicted with a reasonable degree of certainty and thus can clearly be factored into the utility's rate schedule.

Don, I've covered several topics, and not all that your committee is interested in; but I did want to give you our views of several matters. It is our solid belief that municipal utilities should be free to govern themselves for the reasons mentioned above (and many more) and that regulated utilities should be governed by actions of the Kansas Corporation Commission and not be under legislative-mandated rates. The Kansas Corporation Commission, on its own motion, has already investigated use of fuel adjustment clauses in this state and on November 1 will place into effect new insulation standards for residential dwellings and commercial buildings. KMU strongly believes in the latter program for its energy conservation aspects -- and I feel both programs show that the KCC is the place to initiate programs, not in statute law.

Thank you for your consideration of our views.

Cordially,

Louis Stroup, Jr.
Executive Director

LS:gs
cc: KMU Board of Directors

Clipping for September 15, 1977 *Wichita Eagle*

Carter Proposal

Committee Puts Aside Utility Rate Reforms

WASHINGTON (UPI) — The Senate Energy Committee Wednesday put aside President Carter's utility rate reforms, maintaining members did not know enough about them to take action.

Instead, the committee directed its staff to draft a possible substitute plan that would allow federal officials to intervene in utility rate cases to push for energy conservation.

Subject to a final vote perhaps later this week, the committee decided to take no action on the Carter rate reforms.

The reforms include rewarding off-peak use of electricity, called for an end to bargain rates for bulk users of natural gas or electricity, proposed natural gas rates be different for winter and summer and provided for power companies to be ordered, under certain conditions, to link up with other systems.

"We simply don't have the hearing base to act prudently," said Sen. J. Bennett Johnston, D-La., an Energy Committee member. "Do we really want in our quiver these provisions for intervention in state regulatory provisions?"

CHAIRMAN HENRY Jackson, D-Wash., said, "It would be unwise to have the federal government preempt the rights of the states."

"Nobody on this committee understands what we ought to do," said Sen. Pete Domenici, R-N.M. "We are just not ready."

Sen. Floyd Haskell, D-Colo., said, "It would be folly, in my view, for the federal government to take over rate-making," because "what works for New Mexico may not work for Colorado."

He said, however, that he wanted some law reversing the past situation in which "utility rates were designed to increase use of energy."

While the Energy Committee struggled through the energy legislation, witnesses told the Senate Finance Committee of problems with Carter's energy tax ideas.

GOV. DAVID BOREN of Oklahoma, speaking for the Midwest and Southern Governors' Conferences, called Carter's energy plan "tragically shortsighted."

Boren said Carter's plan concentrated on conservation to the exclusion of increased production, but "you can't conserve something you don't have, and a program based on conservation is a dead-end street."

Boren suggested Carter's proposed tax on crude oil be scrapped. Instead, oil prices should be allowed to increase to world price levels, he said, with an "excess profits" tax if energy companies did not plow profits back into exploration.