

MINUTES OF THE SENATE UTILITIES COMMITTEE.

The meeting was called to order by Chairperson Sen. Pat Ranson at 1:30 p.m. on March 7, 2000 in Room 231- N of the Capitol.

All members were present

Committee staff present:

Lynne Holt, Legislative Research Department
Mary Torrence, Revisors of Statute Office
Jeanne Eudaley, Committee Secretary

Conferees appearing before the committee:

Ken Peterson, American Petroleum Institute
Diana Edmiston, Assistant General Counsel, Conservation Division, KCC

Others attending:

See attached list

Sen. Ranson called the committees' attention to the Minutes of Meetings for February 15, 16, 22 and 29, which were distributed to members with a memo. She announced a correction in the February 22 Minutes, with an incomplete sentence which will be corrected. There were no other changes. Sen. Clark made a motion the Minutes be approved as corrected, and it was seconded by Sen. Steffes; the motion passed.

Sen. Ranson announced a continuation of the hearing for **HB 2826-oil and gas; relating to unitization and unit operations.** She introduced Ken Peterson, who gave a brief statement of support for the bill (Attachment 1). Mr. Peterson added that Occidental has two projects ready for unitization, which they believe will result in an increase in production. He also stated that the Kansas Corporation Commission has the final say in this process.

Sen. Ranson referred to the reduction in percentages from 75 to 63 percent, and asked what "excluding the overriding royalty interests and others interests mean"? Mr. Krehbiel answered that overriding royalty interests are free of cost and are carved out of the working interest. As an example, if you are a landowner and I am an oil and gas operator and I would sign a lease with you for the right to go onto your property to drill a well; then I will give you a one-eighths or a three-sixteenths royalty interest; I will have a geologist hired to do the drilling, and there would be other labor and interest costs involved. Generally you give the geologist an overriding royalty interest, so of the seven-eighths ownership share of the operator, which is called the working interest, his share will be reduced by whatever percentage he gives as an incentive to his geologist as an override. Sen. Ranson then asked if the overriding interest would have the right to vote on the unitization plan. Mr. Daniels answered that in the past they would have a right to vote with the royalty owners, which tends to distort the true intent of the law; but the bill would exclude that. Sen. Ranson clarified that the proposed legislation would exclude overriding interests and other interests, and they would not be allowed to vote.

Sen. Ranson referred to the reduction in percentages from 75 to 63% and the difference in the voting requirements when using artificial energy. Mr. Daniels answered with artificial energy and secondary recovery there are existing leases with the oil and gas interests, and the royalty owners are willing to reduce the percentage. However, repressurizing involves horizontal drilling, which is rarely done in Kansas, where the reservoir is opened up to the well board which greatly increases production. You do not have forced pooling in Kansas; consequently, the royalty owners want to maintain the 75% percentage requirement. Sen. Ranson questioned if the KCC has been given the flexibility to assign owners a higher amount of royalty interest than the percentage authorized by law, if those higher interests are granted to land owners as the prevailing industry practice in certain areas of the state? Mr. Daniels answered that is the situation when you have an unleased interest in the property unit and there is no oil or gas operator and you are dealing with a land owner only, then the prevailing practice governing the amount of interest would be used.

CONTINUATION SHEET

MINUTES OF THE SENATE UTILITIES COMMITTEE, Room 231- N Statehouse, at 1:30 p.m. on March 7, 2000.

Sen. Ranson then introduced Diana Edmiston, who stated the Commission neither opposes nor supports the bill; however, she concluded with the observation that the Commission's duty will increase as the threshold percentage required for consent of a unitization plan is lowered (Attachment 2). Sen. Clark questioned the statement that it is difficult to locate the royalty owners, and the problem with the working interest to agree during the process. Ms. Edmiston answered it is a potential problem getting the working interests to agree, and that the objections to the unitization plan is usually in the evaluations and who bears the cost of the plan. She added that modifications to the plan are attempted until there is a resolution. To another question she confirmed that unitization can be accomplished at different layers and sometimes includes more than one parcel. She did not have statistics on the zones involved with proposed unitization plans in the past. Sen. Barone stated he wanted to understand the Commission's position on the legislation and questioned Ms. Edmiston's last paragraph and the fact that fifteen applications were filed since July, 1995, and all fifteen were approved. Ms. Edmiston stated she is not aware if any applications have been turned down. She agreed with Sen. Barone that the fundamental duty remains the same with the legislation, and that is to be fair and equitable. Sen. Brownlee also discussed objections participants have to a unitization plan and who is responsible for the costs. Ms. Edmiston stated the reasons vary with the value of the tracts of land being one. She also stated the cost sharing interests pay the cost based on a proportionment share. She stated the Commission does not oppose the bill, because the statute allows the Commission to make the final determination. Ms. Edmiston stated she was included in the hearings regarding this legislation and assisted in writing it. Sen. Ranson questioned if the Commission's attorney or staff examines the applications and if the applicants are contacted. Ms. Edmiston answered the staff examines the application and attempts to work out problems, if there is one, before the applications comes up for hearing. Sen. Ranson also asked if the Commission is able to stop the plan if there are sufficient objections to it, and Ms. Edmiston answered the statutes gives authority to the Commission to make a determination to stop the plan and referred to the statute and the first paragraph of the bill. Sen. Pugh asked if the bill is directed to any one situation, and Mr. Krehbiel answered he is not aware of one specifically, but that the working interest owners in the Russell area are considering a unitization plan.

Sen. Ranson called attention to a booklet entitled "CO2 Flooding in Kansas", which was presented to the Kansas Independent Oil and Gas Association in a meeting in May of 1998 (Attachment 3). Copies were also distributed to the committee. Mr. Krehbiel and Daniels briefly described the procedure, which is the latest technology and mixes CO2 (carbon dioxide) in an existing well and follows the water flow, and is then pumped into the oil to make it more fluid and move easier. Mr. Daniels referred to studies done at the University of Kansas and a Kansas Geological survey study, which is included in his presentation to the committee on Thursday. Mr. Daniels answered questions from the committee regarding new technology being introduced which will greatly increase oil production in the state. Sen. Ranson called the committees' attention to a written statement of support from Erick E. Nordling (Attachment 4), which has been distributed to the committee.

After discussion, Sen. Steffes made a motion the bill be passed, and Sen. Morris seconded the motion. Roll call vote was taken, and the bill passed. Sen. Ranson announced that Sen. Clark will carry the bill on the Senate floor.

Sen. Ranson announced the committee will hear a review of the statutes and post audit report on the issue of plugging of abandoned wells on Wednesday, followed by a public hearing on Thursday in anticipation of issuing a report on the subject.

Meeting adjourned at 2:30.

Next meeting will be March 8.



Comments Submitted

By the Kansas Petroleum Council

To the Senate Utilities Committee

In support of House Bill 2826, Changes in Oil and Gas Unitization Statutes

March 2, 2000

Madam Chairman and members of the committee, thank you for allowing me to offer these brief comments in support of House Bill 2826, as amended.

My name is Ken Peterson, I am director of the Kansas Petroleum Council, a trade association with members who have oil and gas production operations in our state. Companies include BP Amoco, Exxon Mobil, Occidental, and Vastar, a subsidiary of Arco.

Representatives of Mobil and Occidental worked on development of this legislation in consultation with KIOGA's representatives. The bill basically modernizes and streamlines the state's unitization statutes.

The most notable change, in line with other states are doing, reduces the percentage of working interest owners and royalty interest owners who must approve a unitization project. Lowering the percentage from 75 to 63 percent will help speed up these projects, the benefits of which were explained by previous conferees.

We join KIOGA in asking that this committee recommend House Bill 2826, as amended, for passage.

Thank you.

Senate Utilities
3-7-00
Attach. 1



A-C

Kansas Corporation Commission

Bill Graves, Governor John Wine, Chair Cynthia L. Claus, Commissioner Brian J. Moline, Commissioner

Testimony of Diana Edmiston
Senior Assistant General Counsel
State Corporation Commission of Kansas
Conservation Division
before the
Senate Utilities Committee
March 7, 2000

Good afternoon. I am appearing here today to testify regarding House Bill 2826. The State Corporation Commission regards HB 2826 as a mechanism for balancing the various property interests affected by a proposed oil or gas unit. The Commission therefore neither opposes nor supports the bill, but provides the following information to assist the Committee.

Since July 1995, fifteen applications for unitization have been filed with the Corporation Commission. All applicants were eventually successful in obtaining the consent of 75% or more of the affected interest holders, as the statute currently requires. Only two of the 15 applications were filed before the applicant had reached the 75% threshold.

It is important to note that the numbers provided above do not include unitization plans where the operator has secured the consent of 100% of the affected interest holders. Voluntary unitizations (those with 100% consent) are generally not filed with the Commission.

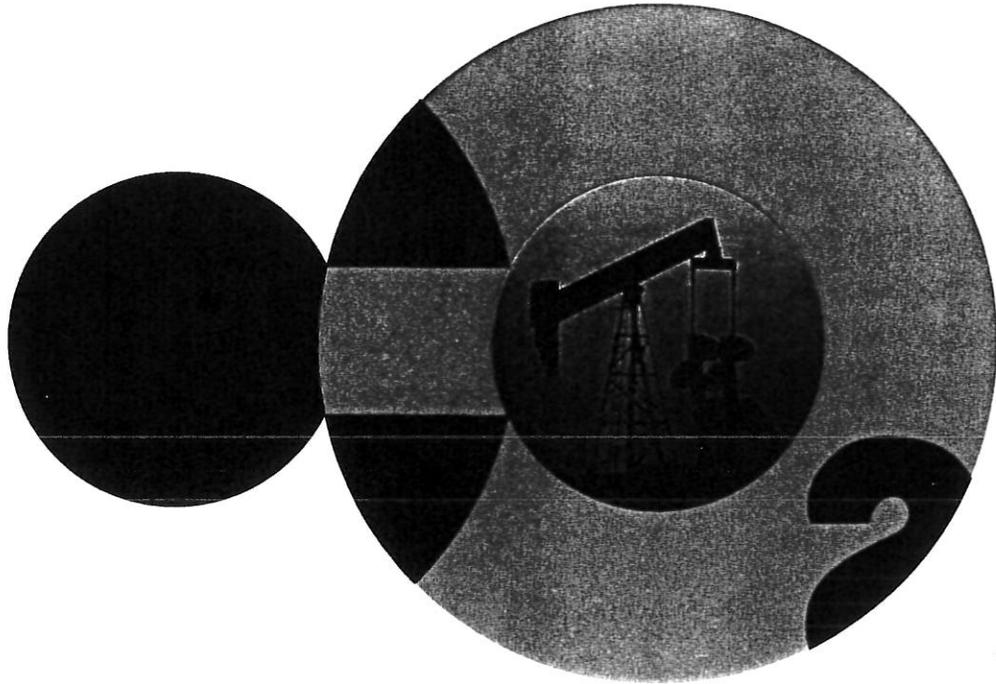
This proposed legislation should have only a minimal impact on the Commission and Staff. Since 1995, an average of 3 unitization applications per year has been filed with the Commission. The Commission staff does not expect the number of unitization applications to increase substantially if HB 2826 becomes law¹. However, the Commission's duty under K.S.A. 55-1305 to determine whether a unitization plan is fair and reasonable, will increase as the threshold percentage required for consent of a unitization plan is lowered.

Should the members of the Committee have any questions I would be glad to address them. Thank you.

Senate Utilities
3-7-00
Attach. 2

¹The number of unitization applications filed with the Commission could increase noticeably in future years, if CO₂ enhanced recovery projects prove to be feasible.

From Bob Krehbiel
H-3 79



TM

"CO₂ FLOODING IN KANSAS"

Presentation to
Kansas Independent Oil and Gas Association
Mid-Year Meeting
May 15, 1998
Liberal, Kansas



Shell CO₂ Company, Ltd.
Seamless Resources and Technology

An Affiliate of Shell Oil Company

Senate Utilities

3-7-00

Attach. 3



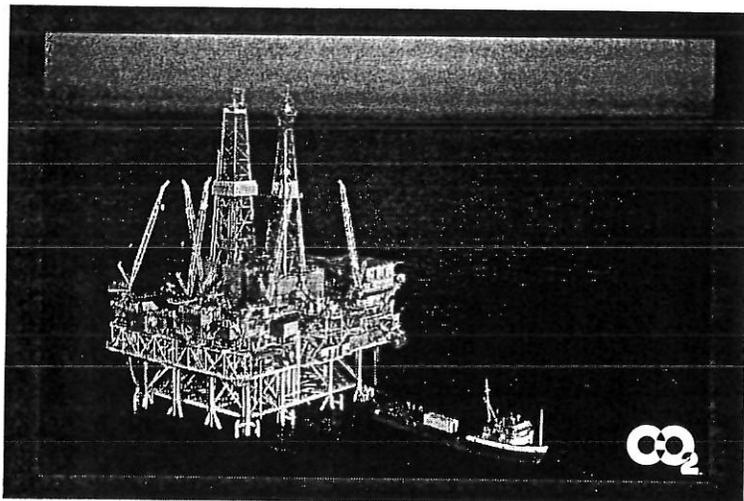
Shell CO₂ Company, Ltd.
Seamless Resources and Technology

Tim Bradley
President



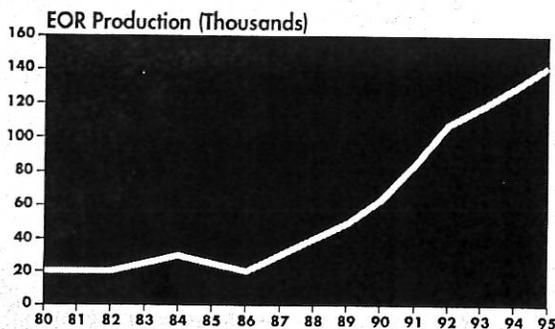
(1) I'M GLAD TO BE HERE, BECAUSE THE TOPIC FOR TODAY IS SOMETHING REALLY EXCITING FOR KANSAS OIL AND GAS PRODUCERS, FOR THE STATE OF KANSAS, AND FOR SHELL CO₂ COMPANY, LTD.

AS YOU KNOW, THE DOMESTIC OIL INDUSTRY HAS BEEN REBORN IN THE LAST 10 YEARS OR SO, AND SHELL HAS BEEN A BIG PART OF IT. SINCE OUR PARENT COMPANY BASICALLY DOESN'T LET US WORK INTERNATIONALLY, WE CONCENTRATE ON WHAT WE CAN DO HERE. AND SO FAR, WE'VE TURNED A LOT OF LEMONS INTO LEMONADE.



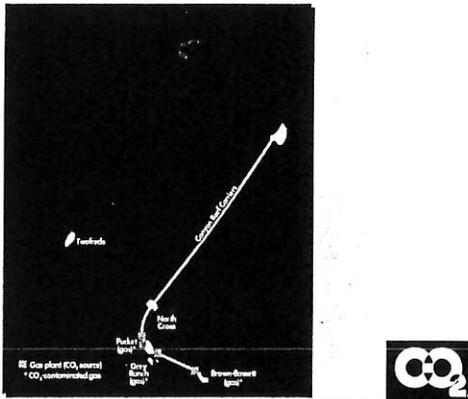
(2) EVERYONE THOUGHT THE GULF OF MEXICO WAS A DEAD AREA. BUT SHELL HAD VISION AND THE DEEPWATER TECHNOLOGY TO TURN IT INTO ONE OF THE WORLD'S HOTTEST PRODUCTION AREAS.

Permian Basin Oil Production Is Also Rising



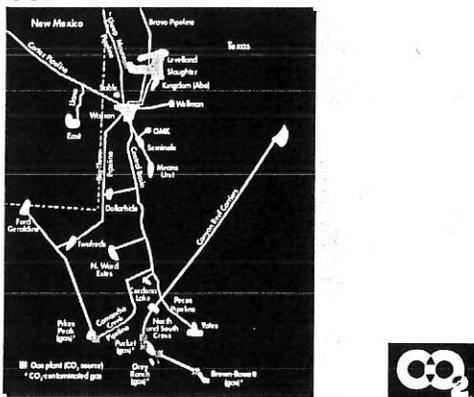
(3) THE PERMIAN BASIN WAS PETERING OUT. IT WAS SHELL'S TECHNOLOGY, INITIATIVE AND COMMITMENT TO CO₂ INJECTION THAT BROUGHT ABOUT THE KIND OF CHANGE YOU SEE HERE. LET'S TAKE A QUICK LOOK AT HOW IT HAPPENED.

CO₂ Floods: 1970s



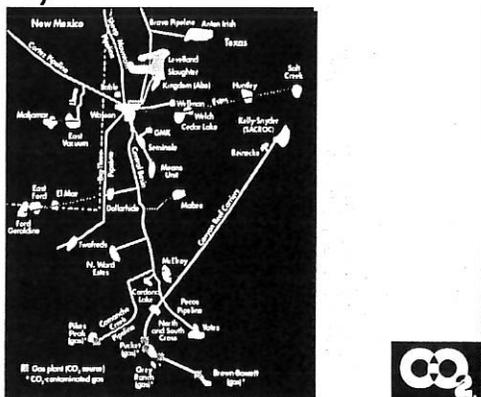
(4) THREE PILOT PROJECTS STARTED IN THE '70s, AND EVERYONE WAITED TO SEE WHAT WOULD HAPPEN.

CO₂ Floods: 1980s



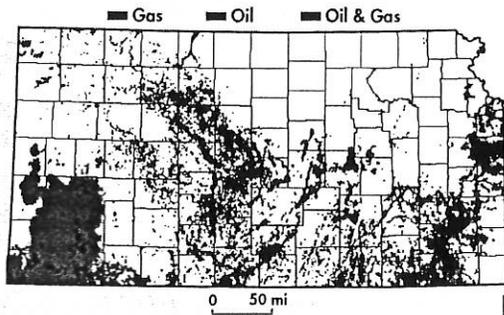
(5) BY THE '80s, THE TECHNOLOGY HAD PROVED ITSELF, AND THE CO₂ INFRASTRUCTURE WAS EXPANDED. THEN THE CRASH OF '86 PUT A LID ON THINGS UNTIL THE '90s.

CO₂ Floods: Today



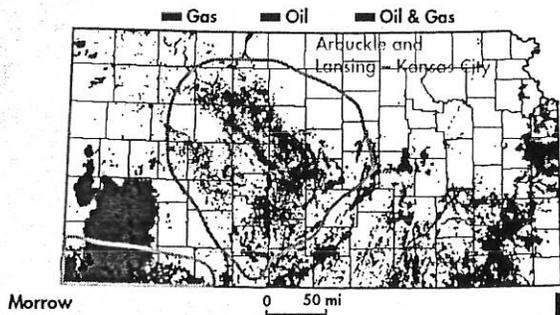
(6) HERE IS WHERE WE STAND TODAY. AS YOU CAN SEE, IT'S A HUGE SYSTEM, AND SHELL CO₂ COMPANY IS BY FAR THE LARGEST PARTICIPANT. EVERYWHERE WE'VE FOCUSED OUR ATTENTION, WE'VE SEEN MORE OIL PRODUCED, MORE JOBS CREATED AND MORE MONEY MADE – FOR EVERYONE. NOW WE'RE FOCUSING ON KANSAS.

Kansas Oil And Gas Fields



(7) HERE YOU SEE THE PRODUCING FIELDS OF KANSAS TODAY, ALL DECLINING IN PRODUCTION. WATERFLOODING IS NOT WORKING ANY MAGIC HERE, AND PRODUCTION IS DOWN TO ABOUT 110,000 BARRELS OF OIL PER DAY.

Kansas CO₂ Flood Potential: 25,000 – 50,000 BPD



(8) AND HERE YOU SEE OUR MISSION FOR KANSAS IN THE FUTURE. OUR EXPERIENCE LEADS US TO THINK THAT WE CAN HELP YOU ACHIEVE AN ADDITIONAL 25,000 TO 50,000 BARRELS OF OIL PER DAY IN INCREMENTAL OIL PRODUCTION. OUR COMPETITION IS NOT OTHER CO₂ SUPPLIERS – IT'S WATERFLOODING. WE PLAN TO REPLACE WATERFLOODS WITH CO₂. IF CO₂ WORKS THE WAY WE THINK IT WILL, WE'RE GOING TO BRING NEW JOBS TO KANSAS AND PUT MONEY IN YOUR POCKETS.

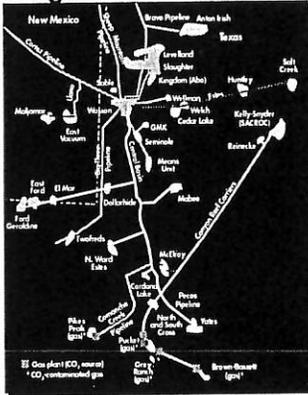


Shell CO₂ Company, Ltd.
Seamless Resources and Technology

(9) BEFORE I TALK ABOUT OUR PROPOSALS FOR KANSAS, YOU SHOULD KNOW MORE ABOUT WHO WE ARE AND THE KIND OF RESOURCES WE CAN PUT TO WORK FOR YOU.



Shell/Kinder-Morgan: 80/20



(10) IN JANUARY OF THIS YEAR, SHELL AND KINDER-MORGAN CLOSED A JOINT VENTURE DEAL THAT GIVES THE NEW COMPANY, SHELL CO₂ COMPANY, LTD. SIGNIFICANTLY EXPANDED RESOURCES. KINDER-MORGAN IS COMPOSED OF ASSETS FROM ENRON AND IS RUN BY RICH KINDER, FORMER PRESIDENT OF ENRON, AND BILL MORGAN, FORMER PRESIDENT OF HOUSTON NATURAL GAS. THEIR MAIN CONTRIBUTION TO THE JV IS THE CENTRAL BASIN PIPELINE --- NEARLY 300 MILES OF PIPELINE THAT RUNS 140 MILES DOWN THE SPINE OF THE CENTRAL BASIN PLATFORM IN WEST TEXAS. THEY OWN 20% OF THE JOINT VENTURE, WHILE SHELL OWNS THE REMAINING 80%.

CO₂ Supply



(11) HERE ARE THE ASSETS. WE OWN AND OPERATE THE MCELMO DOME, THE WORLD'S LARGEST SOURCE OF CO₂.

CO₂ Supply Transporta



(12) WE HAVE MAJOR INTERESTS IN A HUGE CO₂ TRANSPORTATION NETWORK.

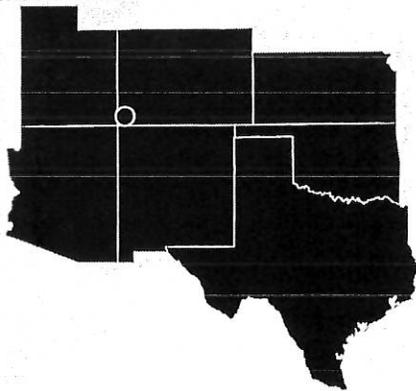
CO₂ Supply Transportation Finance Technology

Now there's one seamless resource
for all your oilfield CO₂ needs



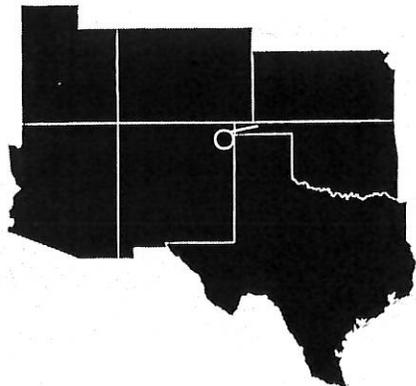
(13) WE OFFER CREATIVE FINANCING SOLUTIONS THAT CAN ALLOW EVEN SMALL OPERATORS TO CASH IN, AND WE HAVE PROVEN TECHNOLOGY IN USING CO₂ TO GET OIL OUT OF THE GROUND, HAVING IMPLEMENTED SEVERAL CO₂ FLOODS IN THE PERMIAN BASIN. ALTOGETHER THESE ASSETS MAKE US A SEAMLESS PROVIDER OF CO₂ RESOURCES AND TECHNOLOGY. LET'S TAKE A CLOSER LOOK.

The McElmo Dome



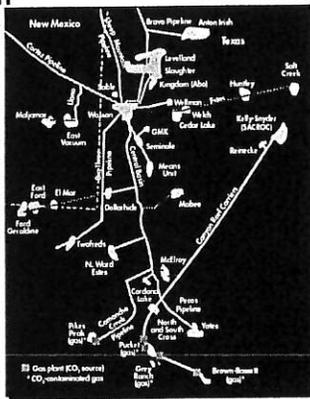
(14) THE MCELMO DOME PRODUCES FROM THE LEADVILLE FORMATION AT 8,000 FEET WITH WELLS THAT PRODUCE AT INDIVIDUAL RATES UP TO 65 MILLION CUBIC FEET PER DAY. LAST YEAR WE COMPLETED A MAJOR EXPANSION HERE, AND OVER THE PAST THREE YEARS PRODUCTION HAS GONE UP BY ALMOST 50%. WE EXPECT TO BE PRODUCING A BILLION CUBIC FEET A DAY IN 1999.

Bravo Dome



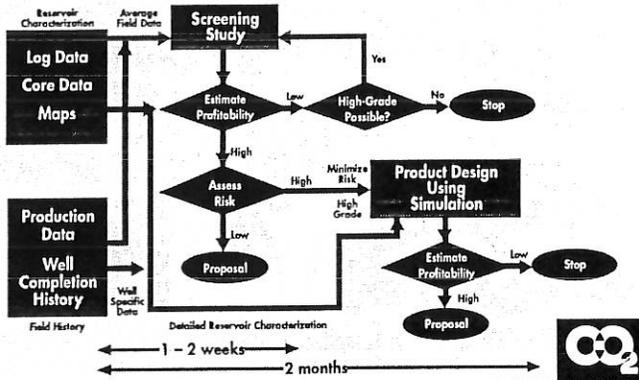
(15) SHELL ALSO HAS A WORKING INTEREST IN BRAVO DOME, WHICH HAS RESERVES OF APPROXIMATELY EIGHT TRILLION CUBIC FEET. THIS DOME CURRENTLY PRODUCES MORE THAN 400 MILLION CUBIC FEET PER DAY FROM MORE THAN 350 WELLS, AND IT IS CONNECTED TO PIPELINES THAT TRAVEL TO WITHIN SIX MILES OF THE KANSAS/OKLAHOMA BORDER.

Transportation



(16) SHELL OWNS INTERESTS IN CO₂ PIPELINES THAT DELIVER MORE THAN ONE BILLION CUBIC FEET PER DAY TO THE PERMIAN BASIN, UTAH, AND OKLAHOMA. CO₂ LINES OPERATE OUT OF HUBS JUST AS NATURAL GAS PIPELINES DO, AND THROUGH THE HUB IN DENVER CITY, WE CAN TRADE AND DELIVER CO₂ VIRTUALLY ANYWHERE IN THE SYSTEM. AND AS I SAID--- TODAY, THAT SYSTEM STOPS ONLY SIX MILES SHORT OF KANSAS.

Technology



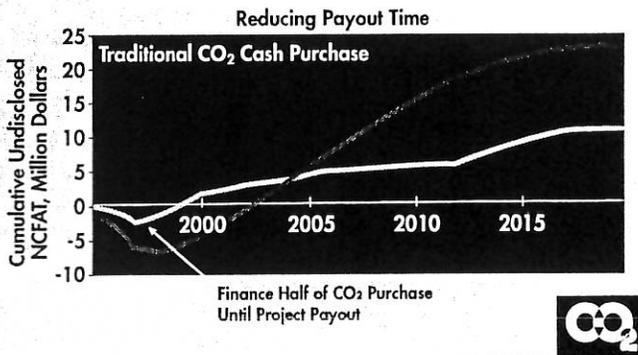
(17) I'M NOT GOING TO GO INTO THIS NOW, BUT SHELL HAS THE COMPUTER TOOLS AND MODELING TECHNIQUES NEEDED TO PREDICT THE PERFORMANCE OF A CO₂ FLOOD WITH REASONABLE ACCURACY. WE CAN HELP YOU REDUCE YOUR RISK AND RUN YOUR CO₂ FLOOD TO MAKE SURE YOU GET AS MUCH MONEY FROM IT AS SOON AS POSSIBLE.

**CO₂ Flood Costs
Down 75%**

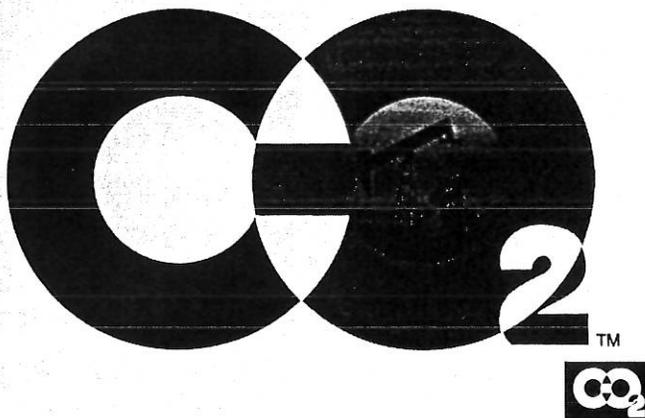


(18) OUR TECHNOLOGY CAN ALSO HELP REDUCE COSTS. IN THE EARLY DAYS OF CO₂ FLOODING, IT WAS TYPICAL FOR A SINGLE INJECTION PATTERN TO COST A MILLION DOLLARS. WE JUST COMPLETED ONE FOR A FOURTH OF THAT.

Financing

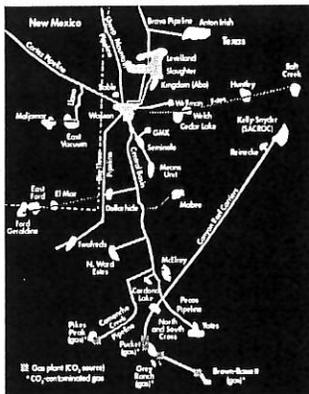


(19) THE FINAL TOOL WE BRING TO THE TABLE IS FINANCING OPTIONS. WE HAVE A NUMBER OF CREATIVE APPROACHES THAT CAN CUT RISK, REDUCE PAYBACK TIME AND INCREASE YOUR PRESENT-VALUE RETURN ON INVESTMENT.



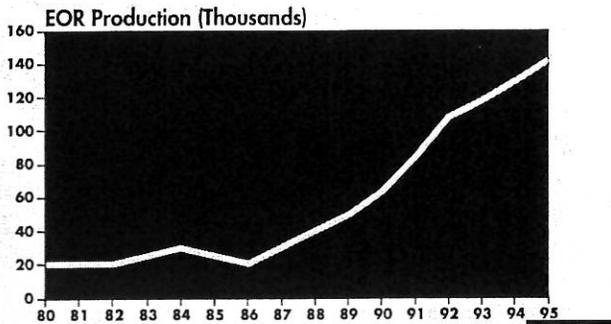
(20) BY NOW, I HOPE I HAVE YOUR INTEREST. BUT BEFORE I TALK ABOUT OUR IDEAS FOR KANSAS, LET'S LOOK AT THE PERMIAN BASIN IN MORE DETAIL. OUR INITIAL STUDIES OF THE MORROW, LANSING-KANSAS CITY AND ARBUCKLE FIELDS IN KANSAS INDICATE THAT YOU COULD SEE SIMILAR RESULTS. SO THE MORE YOU KNOW ABOUT THE PERMIAN BASIN, THE MORE COMFORTABLE YOU'LL FEEL.

Permian Basin Has More Than 40 CO₂ Floods



(21) THERE ARE NOW 40 CO₂ FLOODS OPERATING IN THE PERMIAN BASIN PRODUCING INCREMENTAL OIL.

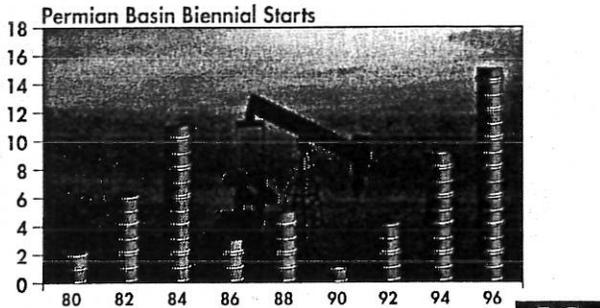
Incremental Production: 150,000 BPD



CO₂

(22) THIS GRAPH SHOWS INCREMENTAL PRODUCTION. EVER SINCE WE RECOVERED FROM THE CRASH OF '86, WE'VE BEEN ON A ROLL, AND TODAY, THE INCREMENTAL OIL PRODUCTION IS APPROXIMATELY 150,000 BARRELS OF OIL PER DAY – AND STILL RISING. THAT'S 150,000 BARRELS THAT WOULD OTHERWISE BE LEFT IN THE GROUND.

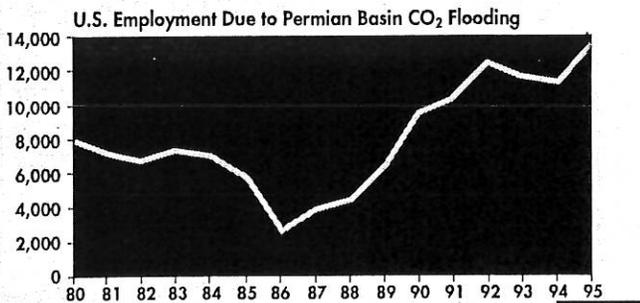
CO₂ Flood Starts Are Increasing



CO₂

(23) HERE'S WHY I SAY WE HAVEN'T SEEN THE END OF THE INCREASE IN INCREMENTAL PRODUCTION – MORE AND MORE PEOPLE ARE GETTING ON THE CO₂ BANDWAGON.

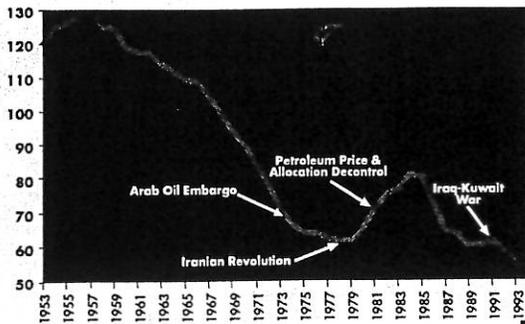
CO₂ Sustains 13,000 Jobs



CO₂

(24) AND HERE'S WHAT CO₂ HAS DONE FOR THE PEOPLE OF TEXAS – ADDED ALMOST 14,000 JOBS TO THE ECONOMY. BUT WHAT DOES THIS MEAN FOR KANSAS?

Kansas Oil Production



CO₂

(25) FIRST, IT MEANS A POTENTIAL FOR MORE OIL, AND MORE MONEY IN YOUR POCKETS. RIGHT NOW, KANSAS IS HURTING – PRODUCTION IS DECLINING BY 5% TO 10% A YEAR. WE CAN HELP CHANGE THAT TREND.

6,000 More Jobs
With CO₂ Floods

CO₂

(26) AND SECOND, CO₂ COULD MEAN UP TO 6,000 MORE JOBS IN KANSAS. WE ARRIVE AT THIS NUMBER BY USING A TEXAS RAILROAD COMMISSION FORMULA, WHICH CORRELATES WELLHEAD REVENUE WITH JOBS. NOW LET'S TAKE A CLOSER LOOK AT EXACTLY HOW WE COULD WORK TOGETHER TO BRING CO₂ TO KANSAS.

Transpetco Bravo Pipeline

- Six Miles from Kansas
- 200 MMCF/D Capacity
- Serves Postle Field

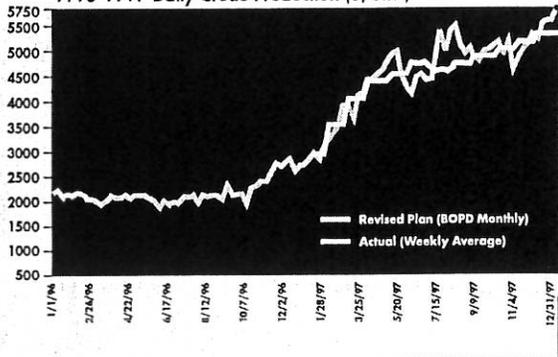


CO₂

(27) AS I SAID, CO₂ IS WITHIN SIX MILES OF KANSAS BY WAY OF THE TRANSPETCO BRAVO PIPELINE NOW SERVING THE POSTLE FIELD IN OKLAHOMA. THIS PIPELINE HAS A CAPACITY OF 200 MILLION CUBIC FEET PER DAY, AND ONLY HALF OF THAT IS NEEDED BY POSTLE.

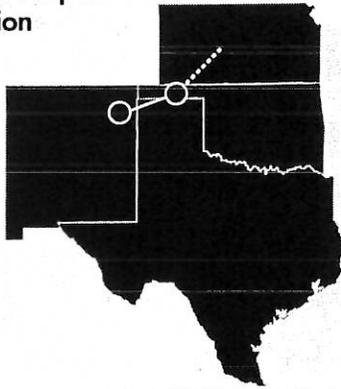
Postle Field

1996-1997 Daily Crude Production (8/8ths)



(28) I SHOULD SAY THAT POSTLE IS PROVING TO BE EXCEPTIONALLY SUCCESSFUL. THIS GRAPH SHOWS HOW IT HAS OUTPERFORMED THE ORIGINAL EXPECTATIONS. THE MORROW FORMATION HERE IN KANSAS IS JUST LIKE POSTLE. I'LL SHOW YOU SOME NUMBERS FOR POSTLE IN A FEW MINUTES, BUT FIRST I WANT TO SAY THAT WE DON'T PLAN TO STOP AT THE MORROW.

Transpetco Bravo Pipeline Kansas Extension



(29) OUR ULTIMATE GOAL IS TO SEE THIS PIPELINE EXTENDED TO CENTRAL KANSAS SO THAT THE LANSING-KANSAS CITY AND ARBUCKLE FORMATIONS CAN TAKE ADVANTAGE OF CO₂.

What Can You Expect?



(30) I'M SURE BY NOW YOU'RE ASKING YOURSELF, "YEAH, BUT WHAT IS THIS WORTH TO ME?" HERE ARE THE GENERAL RULES OF THUMB THAT WE'VE DISCOVERED IN OUR WORK WITH CO₂.

You Can Expect

- Recovery Efficiency: 10% –15%



(31) FIRST, YOU CAN EXPECT CO₂ TO RECOVER 10% TO 15 % OF THE ORIGINAL OIL IN PLACE. THIS RANGE COMES FROM MANY SOURCES: THE TERTIARY OIL RECOVERY STUDY OF 1985, OUR OWN SIMULATION MODELS, AND OUR EXPERIENCE IN THE PERMIAN BASIN.

You Can Expect

- Recovery Efficiency: 10% –15%
- Tertiary Production: 20% – 35% of Primary Plus Secondary



(32) ANOTHER WAY OF LOOKING AT IT IS THAT CO₂ WILL ULTIMATELY RECOVER BETWEEN 20% AND 35% OF WHAT YOU PRODUCED DURING PRIMARY AND SECONDARY RECOVERY. IF YOU GOT A MILLION BARRELS OUT OF YOUR FIELD DURING PRIMARY AND SECONDARY, YOU CAN EXPECT ANOTHER 250,000 BARRELS.

You Can Expect

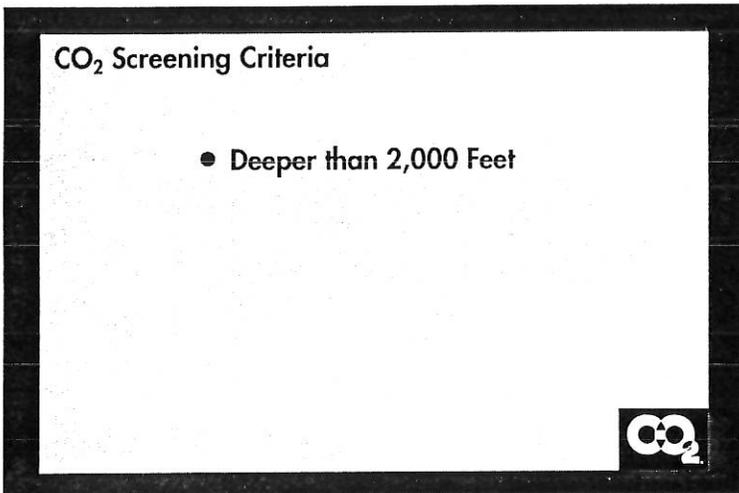
- Recovery Efficiency: 10% –15%
- Tertiary Production: 20% – 35% of Primary Plus Secondary
- Maximum EOR Recovery Rate: 10% of Water Injection Rate



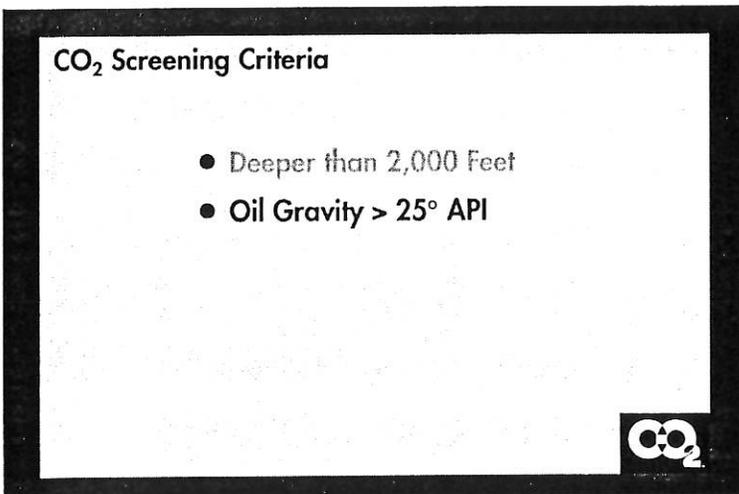
(33) YOUR INCREMENTAL RATE OF RECOVERY WILL TYPICALLY BE EQUAL TO 10 % OF YOUR CURRENT WATER INJECTION RATE. FOR EXAMPLE, LET'S SAY YOU'RE INJECTING 1,000 BARRELS OF WATER PER DAY AND RECOVERING 50 BARRELS OF OIL. WITH CO₂ YOU CAN EXPECT TO RECOVER 50 PLUS 10% OF 1,000, OR A TOTAL OF 150 BARRELS. THAT'S A THREEFOLD INCREASE.



(34) I HOPE BY NOW YOU'RE WONDERING IF CO₂ WILL WORK FOR YOU. FORTUNATELY, THERE ARE SOME EASY GENERAL GUIDELINES THAT CAN GIVE YOU A GOOD IDEA.



(35) FOR CO₂ TO WORK FOR YOU, YOUR WELL SHOULD BE DEEPER THAN 2,000 FEET



(36) THE API GRAVITY OF THE OIL SHOULD BE GREATER THAN 25 DEGREES, AND

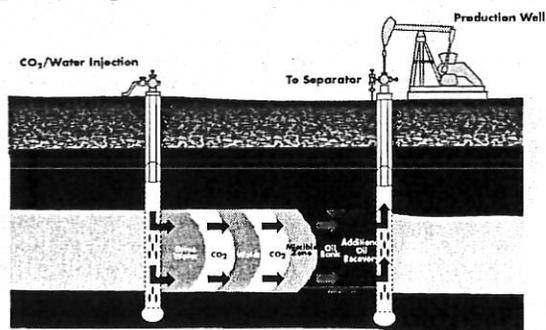
CO₂ Screening Criteria

- Deeper than 2,000 Feet
- Oil Gravity > 25° API
- Favorable Waterflood Characteristics



(37) IT'S NICE IF THE WELL HAS RESPONDED WELL TO WATERFLOODING. TO BETTER UNDERSTAND WHY THESE RULES ARE IMPORTANT, LET ME EXPLAIN A LITTLE ABOUT HOW CO₂ WORKS. HOW MANY OF YOU ALREADY HAVE A PRETTY GOOD IDEA?

CO₂ Flooding



(38) WHEN CO₂ IS INJECTED INTO A RESERVOIR ABOVE ITS MINIMUM MISCIBILITY PRESSURE ---A "MISCIBLE FLOOD" --- THE GAS IS SO COMPRESSED AND LIQUID THAT IT ACTUALLY ACTS LIKE A SOLVENT. IT PICKS UP LIGHTER HYDROCARBON COMPONENTS, IT SWELLS THE TOTAL VOLUME OF OIL, AND IT REDUCES THE OIL'S VISCOSITY SO THAT IT FLOWS MORE EASILY. THE REASON THE DEPTH OF THE FIELD IS IMPORTANT IS BECAUSE IT MAINTAINS THE MINIMUM MISCIBILITY PRESSURE OF THE CO₂. AND THE API GRAVITY IS IMPORTANT BECAUSE THE LIGHTER AN OIL IS, THE MORE SOLUBLE IT IS IN CO₂. BECAUSE GAS CAN MOVE THROUGH A RESERVOIR MORE EASILY THAN OIL, THERE IS ALWAYS A DANGER THAT THE CO₂ WILL FIND A "QUICK-EXIT" AND BREAK THROUGH, LEAVING OIL BEHIND. TO PREVENT THIS, WATERFLOODING IS OFTEN ALTERNATED WITH CO₂ FLOODING. THE WATER HELPS MAINTAIN A STABLE FRONT FOR THE CO₂ FLOOD.

(39) BUT BEFORE I GO ANY FURTHER, I HAVE TO RAISE SOME WARNINGS – SO FAR WHAT I'VE SAID MAKES IT SOUND LIKE YOU INJECT CO₂ IN THE GROUND, AND OIL COMES OUT AUTOMATICALLY. UNFORTUNATELY, THERE ARE A NUMBER OF THINGS THAT CAN GO WRONG, AND THERE IS NO WAY THAT I CAN STRESS ENOUGH THE IMPORTANCE OF SOLID TECHNICAL WORK BEFORE YOU GET INTO A CO₂ FLOOD.

CO₂ Flooding Involves Risk

Do Your Homework

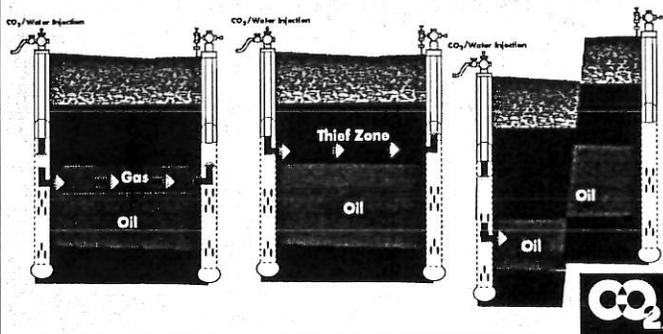


(40) TWO EXAMPLES OF FLOODS THAT DIDN'T PAN OUT ARE SOUTHERN MISSISSIPPI AND SOUTHERN LOUISIANA. IN BOTH THESE CASES, THE TECHNICAL WORK WE DID INDICATED THAT THE FLOOD WAS RIGHT ON THE EDGE OF FEASIBILITY. WE WENT AHEAD, AND THEN OIL PRICES HIT THE SKIDS IN 1986, AND THE FLOODS ENDED UP LOSING MONEY. WE KNOW MORE THAN WE DID THEN, BUT THERE IS STILL SOME RISK, AND YOU HAVE TO DO YOUR HOMEWORK AND HAVE KNOWLEDGEABLE PEOPLE ON YOUR SIDE.

Gas Cap Problem

Thief Problem

Fault

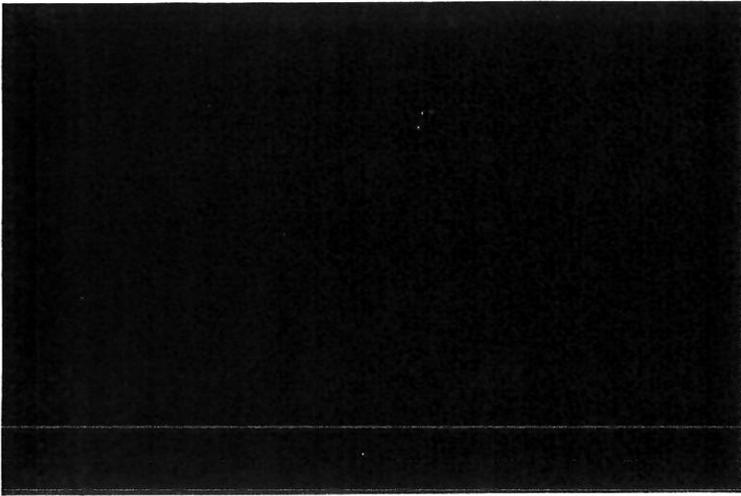


(41) IF CO₂ CONTACTS THE OIL, IT WILL MOVE IT. BUT THERE ARE WAYS THAT THE CO₂ CAN MISS THE OIL ALTOGETHER, AS THIS DIAGRAM SHOWS. IF THERE IS A GEOLOGIC DISCONTINUITY THAT YOU DON'T KNOW ABOUT, IT CAN STOP THE FLOOD COLD. THE WELLBORE MUST HAVE GOOD CONFORMANCE, OR YOU'LL LOSE TOO MUCH INJECTANT TO BE PROFITABLE. IF YOU HAVE A GEOLOGIC ABNORMALITY, A GAS CAP, OR SOME OTHER CONDITION THAT LETS CO₂ FLOW AROUND THE OIL INSTEAD OF THROUGH IT, THE FLOOD WON'T WORK. THIS IS ONE REASON WHY A GOOD WATERFLOOD RECORD IS IMPORTANT. IT COULD INDICATE THE PROBABLE SUCCESS OF CO₂.

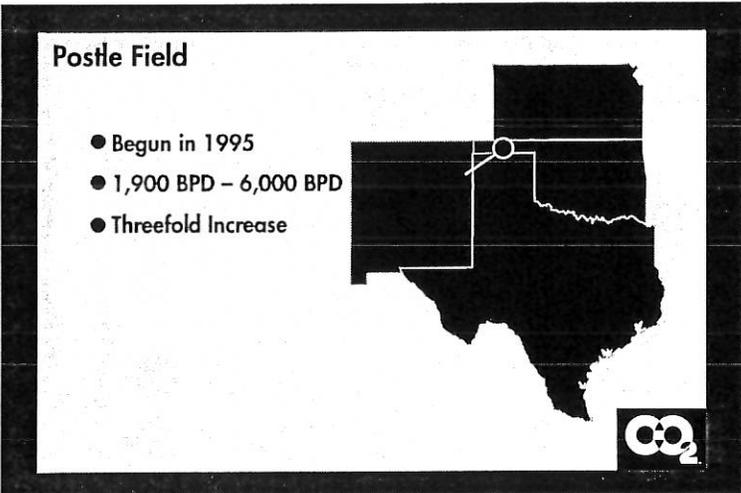
Now The Good News



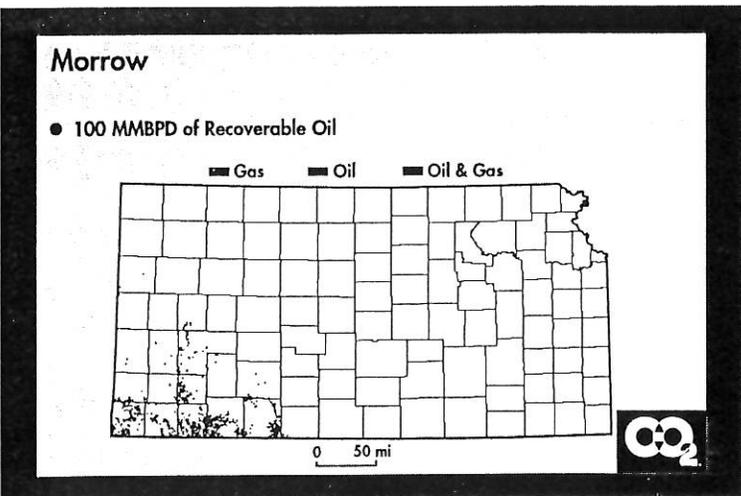
(42) BUT DESPITE THESE OBSTACLES WE HAVE HAD MAJOR SUCCESS IN THE PERMIAN BASIN. WE'VE INCREASED OIL PRODUCTION SIGNIFICANTLY. AND WE BELIEVE WE'VE ADDED NEARLY 14,000 JOBS TO THE ECONOMY. WE THINK WE CAN DO THE SAME FOR YOU. RIGHT NOW, I'D LIKE YOU TO TAKE A LOOK AROUND THE ROOM. YOU'RE LOOKING AT PEOPLE WHO LATER WILL HAVE AN OPPORTUNITY TO HELP CHANGE THE FUTURE OF KANSAS.



(43) FOR NOW LET'S FOCUS ON THE SPECIFIC FORMATIONS IN KANSAS THAT LOOK TO BE THE MOST PROMISING.



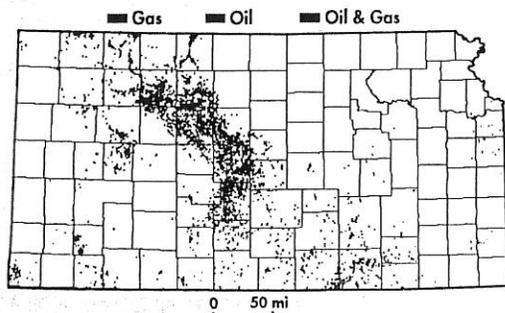
(44) THE MORROW FORMATION IS VERY SIMILAR TO THE POSTLE FIELD IN OKLAHOMA, WHICH HAS BEEN QUITE SUCCESSFUL. THE CO₂ PROJECT THERE WAS BEGUN IN NOVEMBER OF 1995, AND 65 MILLION CUBIC FEET OF CO₂ ARE BEING INJECTED EVERY DAY. SO FAR THE OIL PRODUCTION IS UP FROM ABOUT 1,900 BARRELS PER DAY TO ABOUT 6,000 BARRELS PER DAY, FOR AN INCREMENTAL PRODUCTION OF MORE THAN 4,000 BARRELS OF OIL PER DAY, WHICH IS NEARLY A THREEFOLD INCREASE.



(45) WE THINK THAT CO₂ IN THE MORROW COULD RECOVER AN ADDITIONAL 100 MILLION BARRELS OF OIL. THIS IS A PRETTY EASY FLOOD TO GET STARTED BECAUSE WE HAVE 100 MILLION CUBIC FEET PER DAY OF CO₂ NEARBY IN THE TRANSPETCO BRAVO PIPELINE.

Lansing – Kansas City

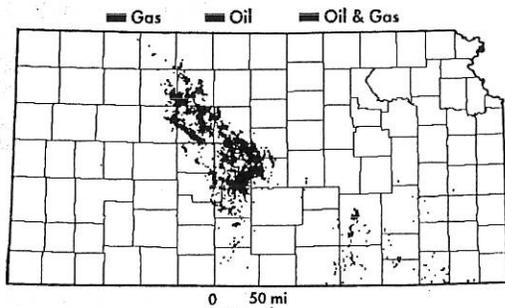
- 300 MMBPD – 400 MMBPD of Recoverable Oil



(46) WE THINK THE LANSING-KANSAS CITY FIELD COULD PRODUCE AN INCREMENTAL 300 MILLION TO 400 MILLION BARRELS. TO GET TO THE OIL HERE, WE NEED TO BUILD A CO₂ LINE WITH A MINIMUM CAPACITY OF 200 MILLION CUBIC FEET PER DAY. SHELL ALREADY HAS THE CO₂ SUPPLY.

Arbuckle

- 300 MMBPD of Recoverable Oil



(47) IT'S HARD TO SAY FROM THE DATA WE HAVE NOW JUST HOW MUCH WE COULD GET FROM ARBUCKLE, BUT IT COULD BE UP TO 300 MILLION BARRELS. IF THE PROSPECTS TURN OUT TO BE AS GOOD AS WE THINK, THIS PROJECT COULD HELP ANCHOR THE COSTS OF ESTABLISHING A CENTRAL KANSAS CO₂ PIPELINE.

An Opportunity For Kansas

- More Money for Kansas Operators

(48) SO TO RECAP WHAT I'VE SAID SO FAR, WE AT SHELL CO₂ COMPANY THINK THERE'S A MAJOR OPPORTUNITY FOR A LOT OF PEOPLE IN KANSAS. YOU AS OPERATORS HAVE A CHANCE TO SEE PROFITS YOU NEVER EXPECTED.

An Opportunity For Kansas

- More Money for Kansas Operators
- More Jobs for Kansas Citizens



(49) MORE PEOPLE WILL HAVE JOBS AND ENJOY A HIGHER STANDARD OF LIVING.

An Opportunity For Kansas

- More Money for Kansas Operators
- More Jobs for Kansas Citizens
- More Income for Kansas Government



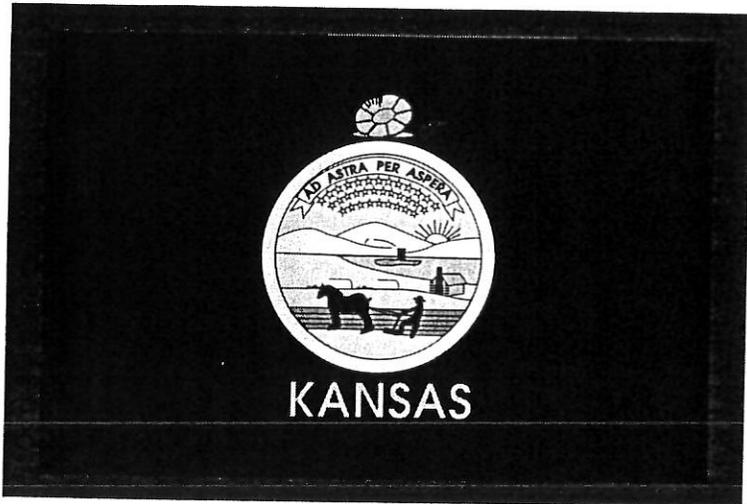
(50) THE STATE GOVERNMENT WILL HAVE MORE INCOME FROM TAXES, FOR A LONGER PERIOD OF TIME.

An Opportunity For Kansas

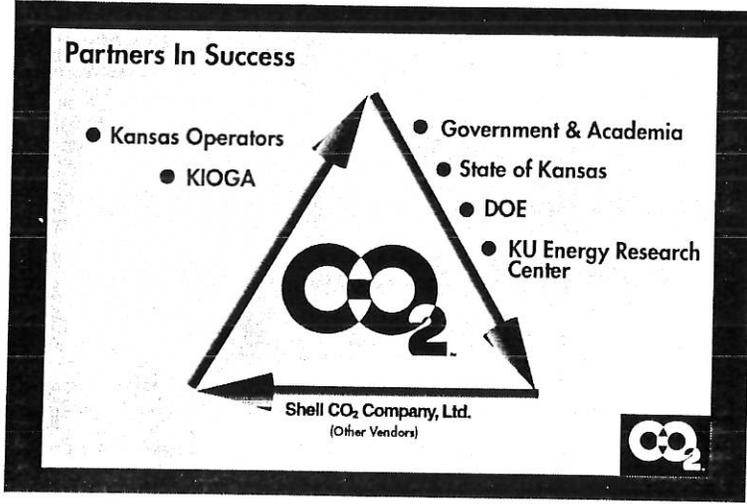
- More Money for Kansas Operators
- More Jobs for Kansas Citizens
- More Income for Kansas Government
- Everyone Wins



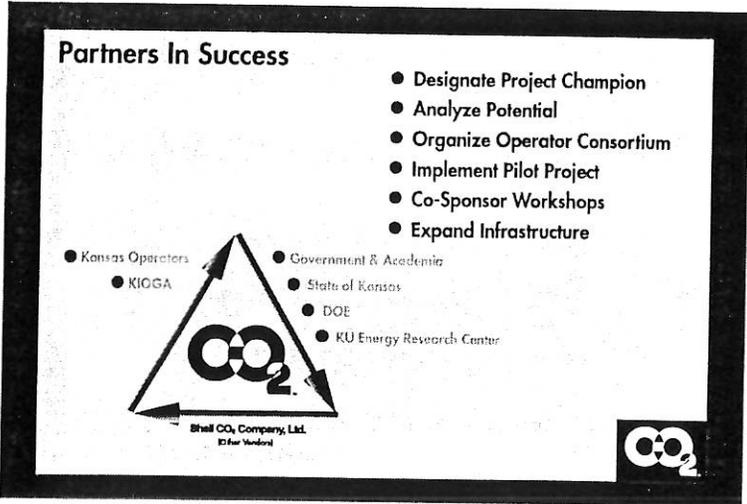
(51) THIS IS A SITUATION WHERE EVERYONE WINS.



(52) WE ARE CONVINCED THAT KANSAS HAS THE OIL RESERVES TO MAKE CO₂ FLOODING VERY ATTRACTIVE. BUT WE ARE EQUALLY CONVINCED THAT NO ONE VENDOR OR OPERATOR OR STATE ENTITY CAN MAKE IT HAPPEN ALONE.



(53) WE ALL HAVE TO WORK TOGETHER – SUPPLIERS, OPERATORS AND THE STATE. WE PROPOSE A PARTNERSHIP WHERE EVERYONE HAS A ROLE TO PLAY. FIRST, LET’S LOOK AT WHAT SHELL WILL CONTRIBUTE.

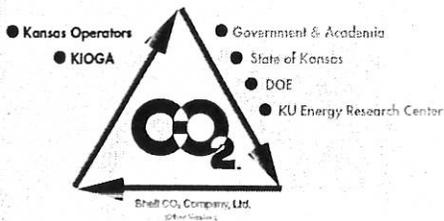


(54) WE ARE GOING TO CHAMPION THIS PROJECT. WE HAVE ALREADY DESIGNATED A PROJECT LEADER, LANNY SCHOELING, AND WE ARE GOING TO HIRE PEOPLE THIS SUMMER TO TAKE A CLOSE LOOK AT THE DATA TO GET A BETTER IDEA OF EXACTLY WHAT THE POTENTIAL IS. THIS LIST SHOWS SOME OF THE OTHER THINGS WE’LL BE DOING.

3-19

Partners In Success

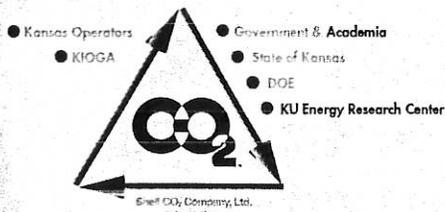
- Share Risks and Rewards
- Share Gas Processing Facilities
- Unitize Reserves
- Share Pipeline Costs



(55) YOU OPERATORS WILL BE CONTRIBUTING THE FIELDS THAT WILL PRODUCE THE OIL. YOU'LL BE SHARING IN THE RISK AND ENJOYING THE REWARDS. TO MAKE THIS WORK, YOU'LL HAVE TO COOPERATE WITH EACH OTHER, SHARING GAS PROCESSING FACILITIES, UNITIZING RESERVES, AND SHARING THE EXPENSES THAT ARISE, LIKE THE COST OF PIPELINES AND THE CAPITAL COSTS OF INJECTION EQUIPMENT.

Partners In Success

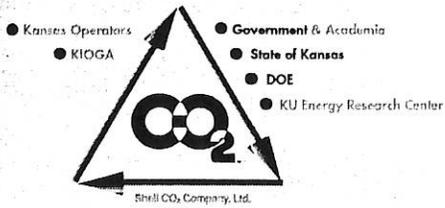
- Provide Data
- Conduct Research
- Gain Access to Federal Funding



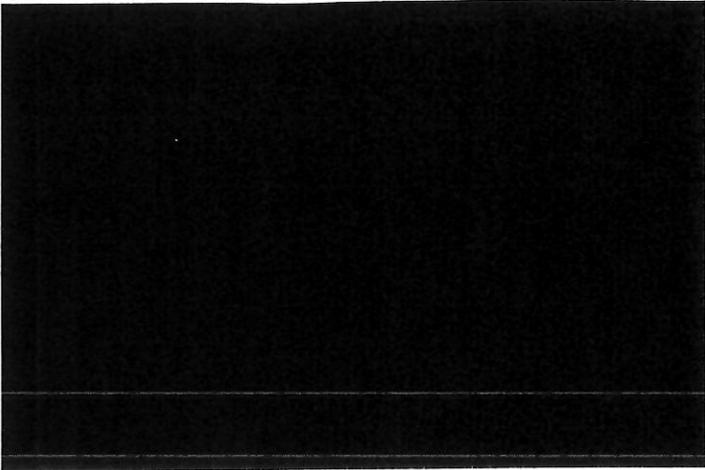
(56) THE KANSAS UNIVERSITY ENERGY RESEARCH CENTER IS CRITICAL FOR THE SUCCESS OF THIS PROJECT. THEY HAVE THE MAPS AND DATA, THEY HAVE GRADUATE STUDENTS TO HELP WITH THE WORK, AND THEY HAVE ACCESS TO FEDERAL FUNDING.

Partners In Success

- Tax Incentives for Incremental Recovery
- Access to Financial and Other Resources from the U.S. DOE



(57) THE STATE CAN CONTRIBUTE TAX INCENTIVES TO FAVOR INCREMENTAL RECOVERY, AND THEY CAN HELP US OBTAIN FINANCIAL AND OTHER RESOURCES AVAILABLE FROM THE U.S. DEPARTMENT OF ENERGY. IT'S VERY IMPORTANT THAT THE STATE PLAY A ROLE. ULTIMATELY THIS PROJECT WILL PUT MORE MONEY IN STATE COFFERS AND PROVIDE MORE JOBS AND A HIGHER STANDARD OF LIVING.



(58) HOW MANY OF YOU THINK YOU MIGHT LIKE TO HELP REVITALIZE THE OIL INDUSTRY IN KANSAS? COULD I SEE A SHOW OF HANDS?

Partners-In-Success Meeting

**KIOGA Annual
Wichita, Kansas
August 24-26**



(59) TO GET THIS UNDERWAY, WE WANT TO INVITE ALL OF YOU TO JOIN US AT A SPECIAL PARTNERSHIP MEETING IN AUGUST, AT THE ANNUAL KIOGA MEETING IN WICHITA. AT THIS TIME, WE'LL ESTABLISH THE CONSORTIUM THAT WILL UNDERTAKE THIS PROJECT. EVERYONE IS WELCOME, EVEN IF YOU DON'T BELIEVE THAT YOUR FIELD IS BIG ENOUGH. THE MORE YOU KNOW ABOUT THE FUTURE OF OIL AND GAS IN KANSAS, THE BETTER OFF YOU'LL BE.

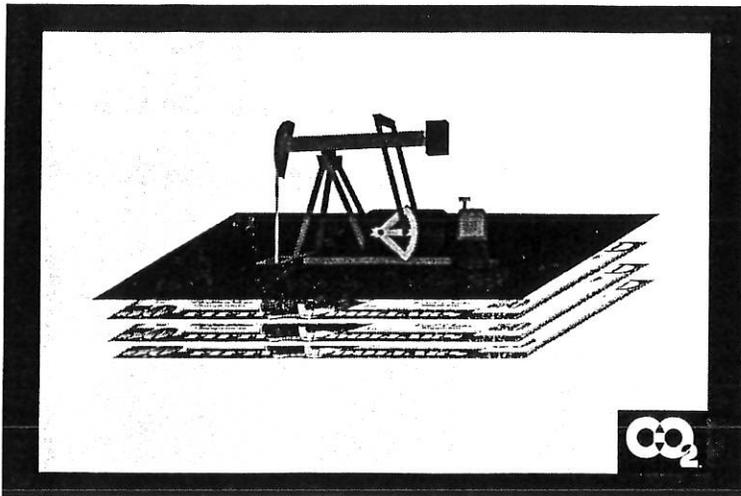
Action Items

- Organize Operator Consortium
- Collect Reservoir Field Data
- Determine Pipeline/CO₂ Source Options for Pilot
- Screen for Pilot Project
- Design/Implement Pilot
- Conduct Regional Market Study
- Conduct CO₂ Workshops
- Construct CO₂ Pipeline from Nearest Economic Source

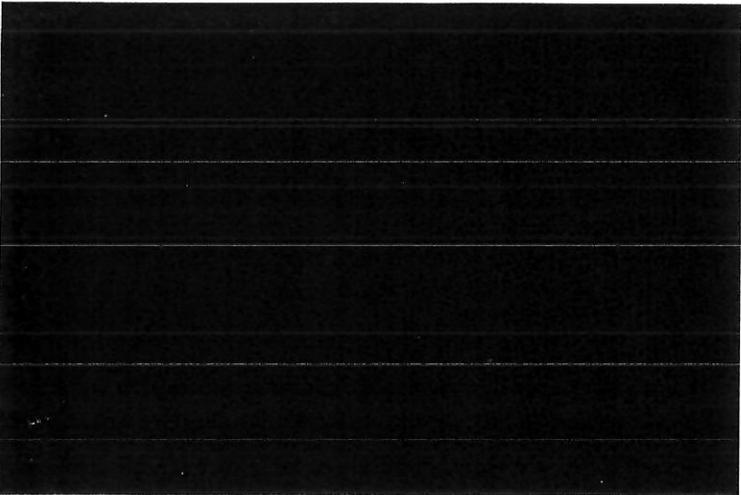


(60) HERE'S HOW WE SEE IT PLAYING OUT. ONCE WE FORM THE CONSORTIUM, WE'LL CONDUCT WORKSHOPS TO INTRODUCE CO₂ CONCEPTS IN DETAIL AND GIVE OPERATORS THE TOOLS THEY NEED FOR AN INITIAL EVALUATION OF THEIR FIELDS. THEN WE'LL UNDERTAKE THE RESEARCH AND THE COMPUTER MODELING STUDIES TO PICK THE BEST FIELDS FOR ONE OR MORE PILOT PROJECTS. USING THE PILOT PROJECTS TO PROVE THE VALUE OF CO₂ FOR KANSAS, WE'LL BE SET FOR SOMETHING WE ALL WANT TO SEE...

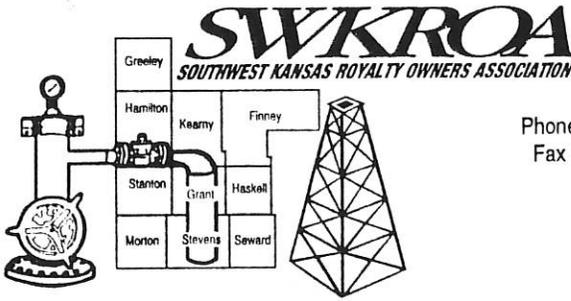
3-21



(61) ... THE REBIRTH OF THE OIL INDUSTRY IN THIS GREAT STATE.



(62) THANK YOU FOR YOUR INTEREST TODAY. I'LL GLADLY ANSWER ANY QUESTIONS YOU HAVE IN THE TIME REMAINING. ///



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PHIL DICK, PRESIDENT

ERICK NORDLING, EXECUTIVE SECRETARY

B.E. NORDLING, ASST. SECRETARY

STATEMENT OF
ERICK E. NORDLING, EXECUTIVE SECRETARY
SOUTHWEST KANSAS ROYALTY OWNERS ASSOCIATION
HUGOTON, KANSAS 67951

March 2, 2000

To the Honorable Members of the Senate Committee on Utilities:

House Bill No. 2826 - relating to gas and oil unitization and unit operations

Chairman Ranson and Members of the Committee:

My name is Erick E. Nordling of Hugoton. I am Executive Secretary of the Southwest Kansas Royalty Owners Association (SWKROA). I am appearing on behalf of members of our Association and on behalf of Kansas royalty owners to support of House Bill No. 2826, as amended by the House Committee, dealing with gas and oil unitization and unit operations.

BACKGROUND ON SWKROA

SWKROA is a non-profit Kansas corporation, organized in 1948, for the primary purpose of protecting the rights of landowners in the Hugoton Gas Field. We have a membership of around 2,500 members. Our membership primarily consists of landowners owning mineral interests in the Kansas portion of the Hugoton Field who are lessors under oil and gas leases, as distinguished from oil and gas lessees, producers, operators, or working interest owners.

One of the early objectives of our Association, formed in 1948, was to fight a severance tax. We have maintained that position throughout the years, even though a severance tax was eventually enacted.

*Senate Utilities
3-7-00
Attach. 4*

UNITIZATION BILL

Members of the Kansas Independent Oil and Gas Association (KIOGA) contacted SWKROA for support of proposed changes to the statutes dealing with unitization and unit operations for oil and gas production. SWKROA, KIOGA, representatives of oil and gas producers, and staff from the Kansas Corporation Commission (KCC) participated in a telephone conference call to discuss the proposed changes.

After a thorough discussion, with contribution from SWKROA representatives, a consensus and compromise was reached by the participants. The bill before you represents the result of such conference.

SWKRO supports the proposed changes of Kansas unitization regulations, as embodied in House Bill No. 2826.

Thank you for this opportunity to present these concerns to your honorable committee

Respectfully submitted,



Erick E Nordling,
Executive Secretary, SWKROA

EEN:een